TECHNOLOGY DEPT.

A PICTORIAL SURVEY OF CURRENT PRACTICE, EQUIPMENT AND MATERIALS

Construction Methods

ENGINEERING LIBRARY
SEP 20 1944
DETROIT

McGRAW-HILL PUBLISHING COMPANY, INC. • PRICE 20 CENTS

SEPTEMBER, 1944

ENGINEER OPERATIONS IN INVASION OF FRANCE • Six pages of photographs illustrating wide range of activities which Engineer personnel and equipment were called upon to perform in establishing and extending Normandy beachhead.

Official U. S. Navy photograph.

Ferry float transporting a submarine down the Mississippi for delivery at New Orleans.

FLOATING SUBS TO THE SEA

"Floating Palaces" of Mark Twain's Mississippi River days have given way to watercraft of many kinds. These vessels, built on the Great Lakes, travel down the river to the sea to join the fight against America's enemies. Among these fighting ships are submarines that are transferred down the Illinois-Mississippi Waterway on a ferry float. When a sub has been delivered at New Orleans the ferry is towed upstream to Lake Michigan where it takes on another "fighting" cargo.

Many floating dry docks, as well as the ferry float above, were built by the Chicago Bridge & Iron Co. of plates furnished by Inland. The dry docks are made in three parts; a large center section and two smaller end sections. When necessary to examine or repair the bottom plates of the dock, the center section can be docked on the two end sections. Likewise, the two end sections can be docked on the center section. When in tow, the end sections are usually docked on the center section.

Before the war, Inland shipped large tonnages of plates to structural shops, tank builders, pipe manufacturers, etc., for peacetime products. When our fighting fleets return to home waters, Inland again will furnish steel for the growing needs of America at peace.

Sheets • Strip • Tin Plate • Bars • Plates • Floor Plates • Structurals
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INLAND STEEL COMPANY

38 S. Dearborn St., Chicago 3, Ill.

Branch Offices: **Cincinnati • Detroit • Kansas City • Milwaukee • New York • St. Louis • St. Paul**

CURRENT JOBS

. . . and Who's Doing Them

BUILDINGS

Public—Navy contract for storehouses at Mechanicsburg, Pa., was awarded to **James Stewart & Co., Inc.**, of New York, N. Y., for $3,379,600. Military hospital buildings in Ontario will be built by **Redfern Construction Co., Ltd.**, of Toronto, for $3,000,000. Navy contract was awarded to **Sound Construction and Engineering Co.**, and **Peter Kiewit Sons Co.**, of Seattle, Washington for $3,000,000 naval storage and transportation station at Bangor. **John A. Johnson & Sons**, of Brooklyn, N. Y., has $2,335,916 contract for postoffice superstructures at Long Island City. **Western Construction Co.**, of Seattle, Wash., will build Navy storehouses at Spokane for $1,723,000. **W. E. Wood Co.**, of Detroit, Mich., submitted low bid of $1,540,000 for dwelling units. Contract for hospital in Halifax, N. S., was awarded to **Brookfield Construction Co., Ltd.**, of Halifax, for about $1,500,000. Low bidder on $1,294,845 duplex residences in Chicago, Ill., was **Welso Construction Co.**, of Chicago. Navy contract for ammunition overhaul facilities at Seal Beach, Calif., went to **Wm. P. Neil Co., Ltd.**, of Los Angeles, for $1,229,424. Quick freeze plant in Nashville, Tenn., will be built by **V. L. Nicholson Co.**, of Nashville, for $1,000,000. Contract for $1,000,000 hospital addition in Montreal, Que., was awarded to **Dansereau, Ltd.**, of Montreal.

Industrial—Contract for $7,500,000 plant at Aliquippa, Pa., was awarded to **Koppers Co.**, of Pittsburgh. Gasoline and cycling plant at Haynesville, La., will be built by **Jones & Laughlin Supply Co.**, of Tulsa, Okla., for $1,750,000. **Petroleum Engineering Inc.**, of Houston, Tex., will build $1,750,000 cycling plant at Columbus. Chemical plant at Louisville, Ky., will be built by **Austin Co.**, of Cleveland, Ohio, for $1,200,000.

Commercial—Dwellings at Mayfair, Calif., will be built for $1,000,000 by **J. M. Walker Constructon Co.**, of Mayfair.

HEAVY CONSTRUCTION

Army contract for $6,634,167 landing field facilities at Muroc, Calif., went to **Peter Kiewit Sons Co.**, of Los Angeles. Car retarders at Enola, Pa., will be built by **Ferguson & Edmondson**, of Pittsburgh, for $2,500,000. **Sound-Kiewit**, of Seattle, has $2,156,217 Navy contract for railroad and other facilities in Washington. Airport runway contract for Langley Field, Va., went to **T. E. Ritter Co.**, of Norfolk, for $1,941,563. **Concrete Materials & Construction Co.**, of Cedar Rapids, Iowa, will build $1,178,019 airport at Waterloo. **N. Fiorito Co.**, of Seattle, Wash., has $1,644,658 contract for parking apron at Boeing Field. **Atlantic, Gulf & Pacific Co.**, of New York, N. Y., has $1,341,950 contract for airport fill at Idlewild. Airfield improvements at Fort Crook, Neb., will be built by **Peter Kiewit Sons Co.**, of Omaha, for $1,324,141. Airport at Decatur, Ill., will be built by **M. J. Boyle & Co.**, of Chicago, for $1,307,299. **Ford J. Twaits Co.**, of San Francisco, Calif., will build $1,261,865 air station personnel facilities at Alameda.

HIGHWAYS

Among recent highway contract awards are the following: Arizona: $1,325,000 to **Basich Bros.**, of Alhambra, Calif. Indiana: $385,863 to **Moellering Construction Co.**, of Fort Wayne. Kentucky: $284,478 to **Codell Construction Co.**, of Winchester. Missouri: $324,653 to **O'Dell & Riney Construction Co.**, of Hannibal. Nebraska: $606,524 to **Booth & Olsen, Inc.**, of Sioux City, Iowa; $616,524 to **Northwestern Engineering Co.**, of Rapid City, S. D.; and $515,935 to **Peter Kiewit Sons Co.**, of Omaha. North Dakota: $234,594 to **Archie Campbell**, of Warwick. Tennessee: $700,026 to **Eller & Olsen**, of Nashville. Virginia: $245,710 to **W. E. Graham & Sons**, of Cleveland, N. C.

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McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York (18)

Construction Methods

A Pictorial Survey of Current Practice, Equipment and Materials

JOHN ABBINK, Publisher

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SEPTEMBER, 1944

THE *How* OF IT

For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

How **76-TON SHIP SECTION** was prefabricated and lowered as unit on to keel blocks. —p. 57

How **ARMY ENGINEERS** played vital role in invasion of France. —p. 60

How **PONTON EQUIPMENT** was placed in service by Engineers for passage of Army motor vehicles. —p. 61

How **UNDERWATER OBSTACLES** planted along French shore by Nazis were removed by Combat Engineers. —p. 63

How **CHERBOURG STREETS**, shattered by bombing and gun fire, were repaired. —p. 65

How **FACTORY-BUILT HOUSES** of TVA sectional design were built for war workers. —p. 66

How **BATTERY OF LAMPS** was used to dry exterior paint coat of mobile prefabricated house. —p. 68

How **SHIP SECTIONS** were prefabricated and hauled 38 miles from inland plant to tidewater assembly yard. —p. 70

How **HOUSE-MOVING EQUIPMENT** was used to move ship sideways on to marine railway. —p. 71

How **BROOKLYN BRIDGE TRACK REMOVAL** is making 8,000 tons of scrap metal available for war purposes. —p. 74

How **CLOSE TOLERANCES** were maintained by ingenious design of precision forms in concrete wind tunnel. —p. 78

How **INNER FORM FOR BELLMOUTH** was built of metal lath and plaster. —p.79

How **MULTIPLE ORIFICE LUBRICATOR** was used to oil hoisting ropes. —p.80

How **COMPRESSED AIR BUFFER** cleaned threads on shee-bolts and tierods to permit re-use. —p. 80

How **TRUCK WAS TAKEN APART** in India, flown across Himalayas and reassembled in China. —p. 81

How **IMPACT SADDLE WRENCH** was used to pull steel shell plates to contour of ship's hull. —p. 81

How **BETTER LIGHTING** can improve seeing conditions in drafting rooms —p. 90

How **COOLNESS TO EYE** results from special metal ceiling to improve drafting room lighting. —p. 90

McGRAW-HILL PUBLISHING COMPANY, INC., 330 WEST 42d STREET, NEW YORK (18), N. Y.

JAMES H. McGRAW, Founder and Honorary Chairman

Editorial and Publishing Offices: 330 West 42nd St., New York (18); 520 North Michigan Ave., Chicago (11); 68 Post St., San Francisco (4); 738-9 Oliver Bldg., Pittsburgh; Aldwych House, London, W. C. 2, England. Branch Offices: Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Los Angeles; Atlanta, Ga.

JAMES H. McGRAW, JR., President — **HOWARD EHRLICH**, Executive Vice-President for Business Operations — **JOHN ABBINK**, Executive Vice-President for Editorial Operations

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CONSTRUCTION METHODS, September, 1944. Volume 26, Number 9. Published Monthly, price per copy. **Return Postage Guaranteed.** Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, 330 West 42nd Street, New York (18), N. Y. **Subscription rates**—United States, Mexico and Central and South American countries, $1.00 a year, $1.50 for two years, $2.00 for three years. Canada, $1.50 a year, $2.50 for two years, $3.00 for three years. Great Britain and British Possessions, 12 shillings a year, 36 shillings for three years. All other countries, $2.00 a year, $6.00 for three years. Entered (or reentered) as second class matter December 1c, 1936, at the Post Office of New York, N. Y., U. S. A., under the act of March 3rd, 1879. Printed in U. S. A. Cable address: "McGrawhill, New York." Member of A. B. P. Member of A. B. C. Contents copyrighted 1944 by McGraw-Hill Publishing Co., Inc., 330 West 42nd Street, New York (18), N. Y.

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To .....

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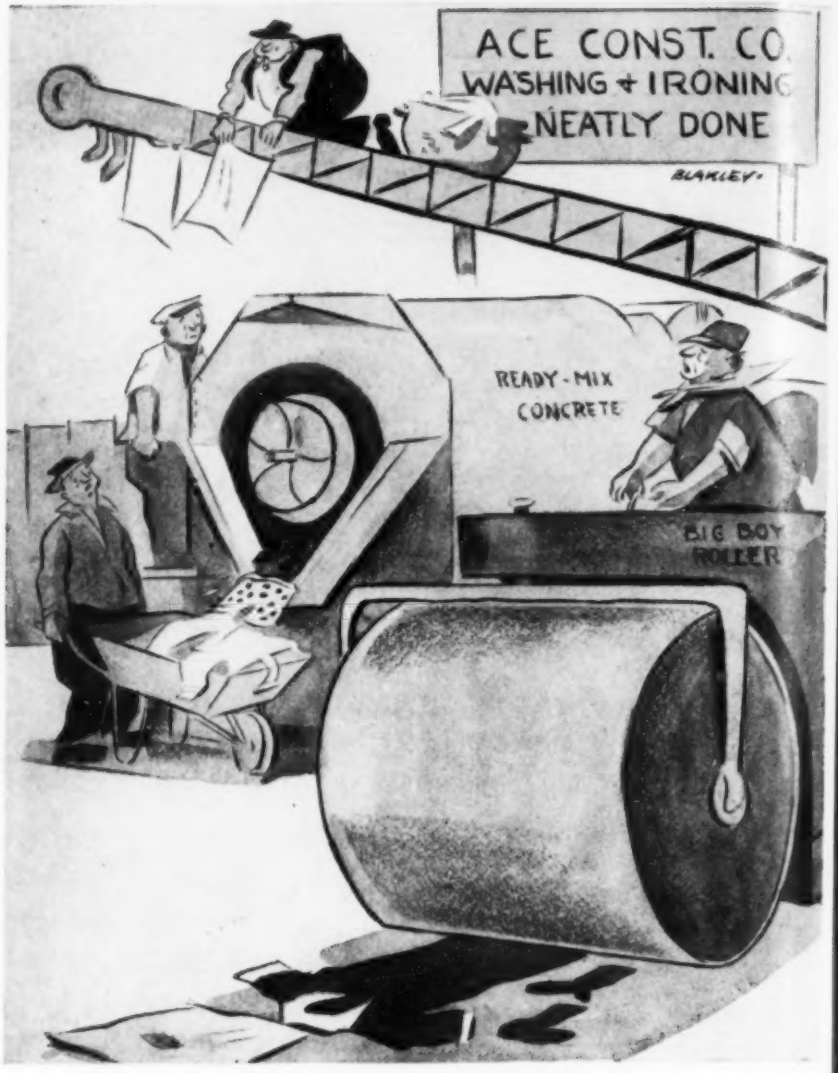
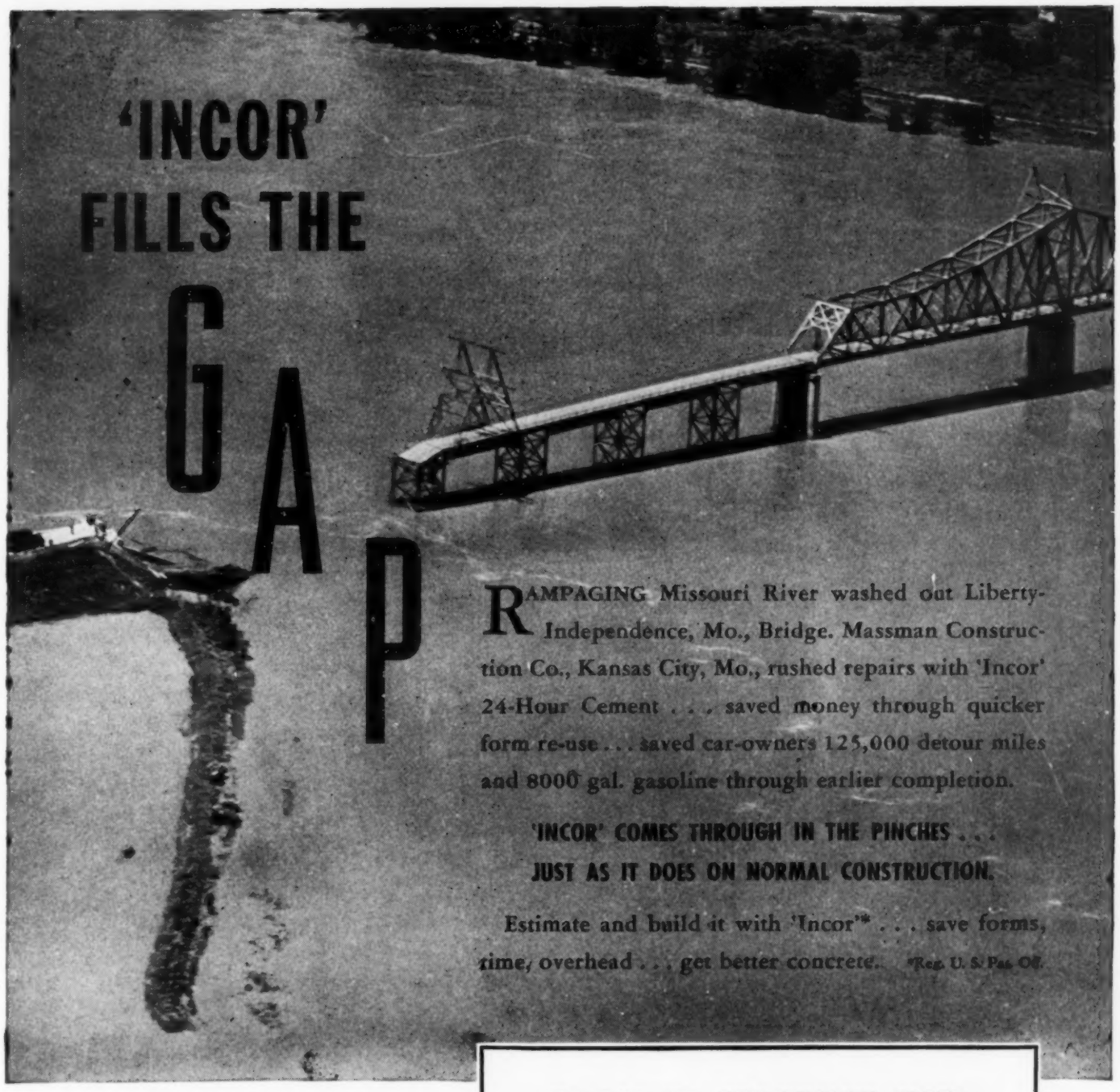
THE JOB JESTER

CARTOONS DRAWN FOR CONSTRUCTION METHODS



"I hope the government lets us get started on building again soon!"

"Why don't you look where you're going, Corporal?"



'INCOR' FILLS THE GAP

RAMPAGING Missouri River washed out Liberty-Independence, Mo., Bridge. Massman Construction Co., Kansas City, Mo., rushed repairs with 'Incor' 24-Hour Cement . . . saved money through quicker form re-use . . . saved car-owners 125,000 detour miles and 8000 gal. gasoline through earlier completion.

'INCOR' COMES THROUGH IN THE PINCHES . . . JUST AS IT DOES ON NORMAL CONSTRUCTION.

Estimate and build it with 'Incor'* . . . save forms, time, overhead . . . get better concrete. *Reg. U. S. Pat. Off.

PLAN IT FOR QUALITY, SPEED, ECONOMY

Estimate each job with BOTH Lone Star Cement and 'Incor' 24-Hour Cement. Results since 1927 prove 'Incor' advantages on—

STRUCTURES — 24-hour form removal . . . 50% less forms . . . no re-posting, earlier use.

WATERTIGHT CONCRETE— workable mixes . . . one-day curing . . . dense and durable.

WINTER WORK at summer speed . . . saves heating, tarps, forms.

HEAVY-DUTY FLOORS— overnight service, greater wear-resistance.

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How to S-T-R-E-T-C-H the life of your war-weary equipment

DURING the past 18 months, hundreds of Lorain owners and operators have found the Emergency Fix-It Handbook a big help in keeping going—and it can do the same for anyone else who is struggling along with continued use of aging equipment—working at longer hours, under heavier wartime loads, encountering delays in spare parts deliveries.

This 28-page Handbook contains 32 ideas on how to rebuild worn parts for further use—how to substitute for critical, hard-to-get materials—how to make emergency repairs that will keep your unit on the "front line". Though written for Lorain cranes and shovels, most of the methods given, with no or only minor modifications, may be applied to many other makes of cranes and shovels—and even to many other types of construction equipment.

Even with our war successes, no one yet knows when new equipment will again be available. In the meantime you must keep producing. Therefore, isn't it worth sending a penny postal request to Thew-Lorain and getting a copy of this helpful Emergency Fix-It Handbook? Do it today—there's no obligation.

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Reg. Trade Mark

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Any way you figure it——

Extra Yardage and Lower Cost per Yard with

EUCLIDS

● It doesn't take a slide rule expert or a lot of trick mathematics to prove that Rear-Dump and Bottom-Dump EUCLIDS increase production and haul earth, rock, coal and ore at lower cost per ton or yard. Built to haul loads of 15 to 30 tons in off-the-highway service at speeds up to 34 m.p.h., Euclids carry more payloads per day and keep hauling costs down.

Using efficient digging and loading equipment with fast, economical Euclids you can move big yardages faster and at lower cost on all lengths of haul. Compare Euclid speed and capacity with other types or combinations of earth moving equipment and you'll know why leading contractors everywhere are using Euclids now or are planning to replace their present equipment with efficient Euclids as soon as they can.

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EUCLID SELF-POWERED HAULING EQUIPMENT For EARTH . ROCK . COAL . ORE

One of These Three May Be Your Answer to Lower Maintenance Costs

Q Does "on-the-job" power lubrication add "M.P.T."* to machines?

A You bet it does! It can cut lubrication time up to 75% over hand gun lubrication, leaving more time for work. In one typical case, Alemite Portable Service Stations cut "cat" track roller wear by one-third — keeping machines on the job longer between overhauls. And that, friend, is adding "M.P.T."* to machines.

**More Productive Time*

Alemite Portable Service Stations Put Power Lubrication "On-the-Job"

This development by Alemite is a complete power lubrication department on wheels that carries lubricants to machines on the job. The unit includes high- and low-pressure Alemite Barrel Pumps, Alemite Motor Oil Dispenser, hose reels and gas engine air compressor.

This type of "on-the-job" lubrication has proved its efficiency on construction projects everywhere. Its increasing use shows that it is destined to play an important role in peacetime competition. Write for catalog. Alemite, 1840 Diversey Parkway, Chicago 14, Illinois, or Belleville, Ontario.

Q Are portable service stations just for lubrication?

A No. They have many uses. For high pressure power lubrication of all bearings equipped with pressure gun fittings. This covers practically every type of machine. For rapid filling of gear housings, final drives, rear axles, transmissions and crank cases. For tire inflation, engine cleaning, paint spraying, etc. Versatile outfit, isn't it?

Q Does "on-the-job" lubrication save on lubricants?

A Definitely. Here's the experience of one organization: using the "barrel to bearing" application of lubricants from an Alemite Portable Service Station, a saving of 19% was made in the consumption of grease and oil. And every bearing and gear got clean, uncontaminated lubricants. Interested in a saving in lubricants?

WANTED
Tough Job by Man with "MML" Degree!

This man, an Alemite Lubrication Specialist, is a "Master of Modern Lubrication." His technical training, skill and experience equip him to come on your job and consult with you about applying the most modern lubricating methods. He has added more productive time to machines, saved lubricants and man power. He has installed safer, surer, more accurate lubricating methods.

He's ready to go to work for you now, backed by the world's most experienced organization in the handling and application of lubricants. Call him. Or, if you prefer, write, wire or phone Alemite for his address.

An Associate Product of STEWART WARNER

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First in Modern Lubrication

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YOUR BEST BET
WHEN THE WAR ENDS

A FEW GOOD TERRITORIES STILL AVAILABLE TO INTERESTED DISTRIBUTORS

The benefits we have gained in building hundreds of road rollers for the army and our allies . . . up-to-the-minute facilities . . . modern production methods . . . the testing and proving of many new and important developments . . . will be generously shared with roadmen when the war ends. Bear this in mind before buying a new road roller — your best bet will be a HUBER.

HUBER ROLLERS

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PLAN TODAY TO PROFIT ON THE

With the Faster Power of *TOURNAPULLS* You Can Extend Profitable Haul Distances . . . Save on Equipment Investment and Cut Cost per Yard . . . Try It.

The longer runways and straighter, wider highways, already planned for postwar, will require longer hauls than ever before. You can profitably handle those longer hauls with the rubber-tired power of Tournapulls. Operating from 2.6 to 14.9 m.p.h. Tournapulls get you cheap dirt on any haul from 300 feet to 3 miles.

COMPARE WITH CRAWLING TRACTORS

ONE-WAY HAUL DISTANCE—CU. YDS. PER HOUR*

Tractor-drawn Scrapers	400′	600′	800′	1,000′	2,000′	3,000′	4,000′	5,000′	6,000′
30-Yd. Capacity			175	153	97	71	56	46	39
23-Yd. Capacity		187	162	142	89	65	51		
18-Yd. Capacity	196	163	139	122	74				
15-Yd. Capacity	170	142	121	106	65				
With 15-Yd Super C Tournapull you get:	200	180	168	156	116	91	76	65	55

*All units pusher loaded on level.

Note that even on short hauls—400 to 1000 feet one-way—Tournapulls compete very favorably with larger crawler-scraper outfits. While on longer hauls—2000 to 6000 feet—Tournapulls move from 19% to 41% more than even a 30-yard crawler-scraper outfit.

LOWER FIRST COST . . . LOWER OPERATING COST

What's more, you get this extra yardage for less first cost and a lower hourly operating cost. Super C Tournapulls cost from $500 to nearly $7,000 less than crawler-scraper units of comparable hourly capacity. Hourly operating costs run approximately 4% to 21% less. Figure what that can mean to you on a 10,000-hour operating life.

See Your Dealer NOW

Why penalize yourself with more costly, slow-moving rigs when you can have faster-moving, job-proved Tournapulls? You'll move more yardage, more profitably.

A limited number of Super C Tournapulls are available for civilian use. See your LeTourneau distributor Now for priority requirements and delivery dates.

ONLY IN TOURN... JOB-PROVED, P...IT

TOURNAPULL DESIGN concentrates load weight on the front drive wheels to give you greater traction, quicker acceleration and faster turning.

PROVEN, CABLE-OPERATED SCRAPER—LeTourneau Carryall Scraper used with Tournapull is simi-

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JOB-PROVED 2,000 BUILT AND SHIPPED

Manufacturers of TOURNAPULLS*, DOZERS, CARRYALL* SCRAPERS, POWER CONTROL UNITS, ROOTERS*, SHEEPS FOOT ROLLERS, TOURNAROPE*, TOURNATRAILERS*, TOURNAWELD*, TOURNACRANES*.

*Trade Mark Reg. U. S. Pat. Off.

NGER HAULS OF TOMORROW

Good haul roads enable you to attain higher average speeds, thus move more yardage. Here Harrison Construction Co., long-time user of LeTourneau equipment, uses seven Super C Tournapulls to construct new runways on a Knoxville, Tennessee, airport.

LLS DO YOU GET ALL THESE IT-ASSURING FEATURES . .

r in design and operation thousands used so pro-tably with tractors in the st. It's cable-controlled, has positive-ejection tailgate at wipes the bowl clean even the stickiest mud.

OAD, HAUL, SPREAD
—Tournapulls, like all big-pacity scrapers, are de-gned for pusher loading. hey load quickly, then haul and spread their own loads.

BIG, PNEUMATIC TIRES provide greater flotation and extra traction; same time cushion operating shocks to reduce repair costs; have few working parts.

INTERCHANGEABILITY —from Carryall to Crane, Wagon or Trailer widens use and profit possibilities of Tournapull prime mover.

Frank Mashuda is owner of 7 Super C Tournapulls, used on 5000-foot hauls at Moon Township Airport near Pittsburgh, Pa.

TOURNAPULLS

RUBBER-TIRED POWER FOR FASTER EARTHMOVING

Only PAINT Deep

But the Quality Goes Through and Through

The RED-STRAND in "HERCULES" Wire Rope is only paint deep. But what it stands for penetrates through and through, as it represents long experience, diligent research, and advanced manufacturing methods—all of which add up to top-flight service.

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Meet the unprecendented demands of today by specifying "HERCULES" on your purchase order.

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(U.S. Engineering Dept. Photo)

Close-up of combination gravel and quarry plant outlined above

500 TONS AN HOUR

TELSMITH PLANT SPEEDS CONSTRUCTION OF NORFORK DAM . . .

On the North Fork River, near Norfolk, Arkansas, the huge Norfork Dam nears completion. For its 1,500,000 cu. yds. of concrete, Telsmith engineers designed an aggregate plant that produces 500 tons an hour. Sand and gravel come from the White River; limestone from a nearby quarry. Two correlated processing systems are used . . . producing four sizes of coarse aggregate, sand and limestone dust. Waste is held to a minimum. Telsmith plant-flexibility permits adding dust to sand when necessary. All plant machinery, except some conveyors and electrical equipment, is Telsmith-built. Its "very satisfactory" performance helped expedite concrete placement for Morrison-Knudsen Co. and Utah Construction Co., the general contractors. *Get Telsmith Complete Plant Bulletin EP-10.* O-11

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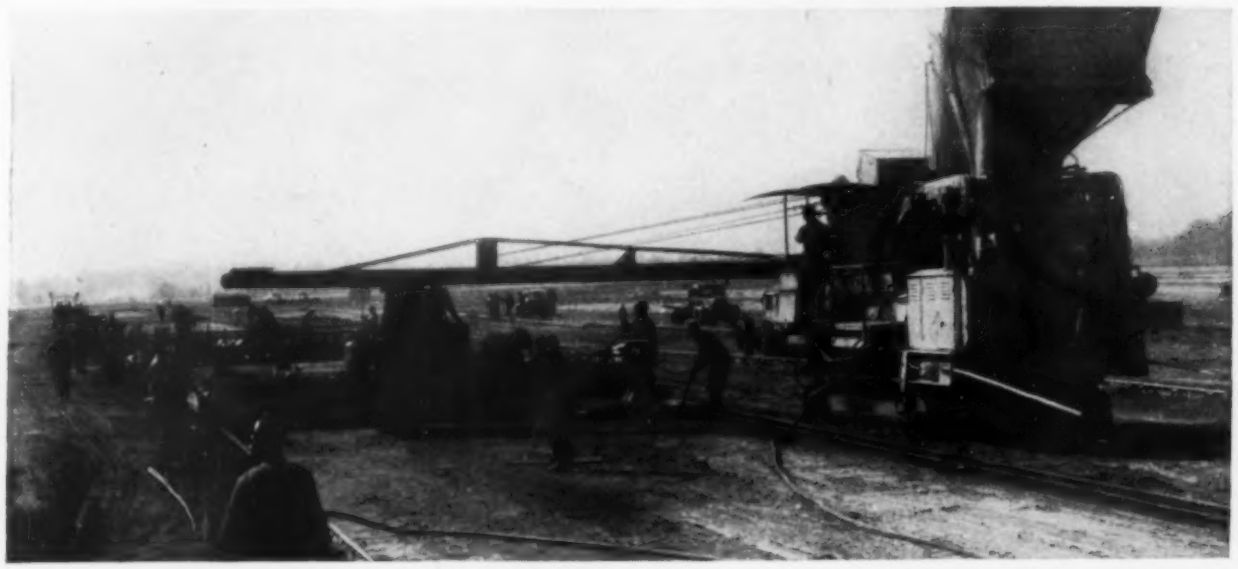
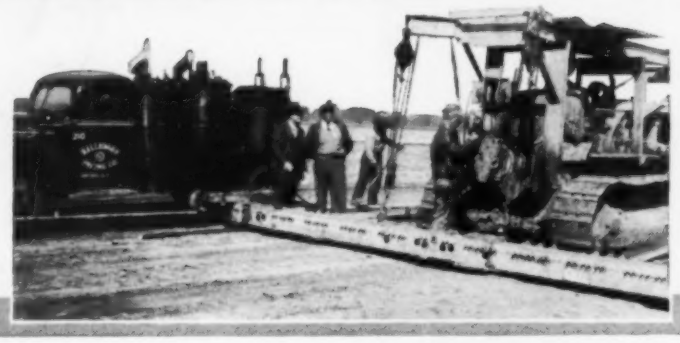
Brandeis M. & S. Co. Louisville 8, Ky. | Rish Equipment Co. Charleston 22 & Clarksburg, W. Va. | Rish Equipment Co. Roanoke 7 & Richmond, Va. | North Carolina Eqpt. Co. Raleigh & Charlotte, N.C. | Wilson-Weesner-Wilkinson Co. Knoxville 8 and Nashville 6, Tenn.



Ballenger Paving Company, Greenville, South Carolina, has just completed well ahead of schedule the concrete paving of runways on this rush airport project in eastern Georgia. The job was operated on a daily schedule of 800 batches and 5,000 square yards of concrete. In the photo at right a Gulf Service Engineer (left) is shown consulting with Superintendent Jim Chandlee on the lubrication of the equipment employed on this job.



Gulf Quality Lubricants and Fuels

help paving contractor complete rush airport job ahead of schedule!

"With Gulf Products we have been able to push equipment to the limit without delays from mechanical troubles" —

says Superintendent Jim Chandlee

GULF quality lubricants and fuels have been a big help to us in beating our contract schedule on this rush airport job," says Superintendent Jim Chandlee. "Proper lubrication and good fuel performance have enabled us to push equipment to the limit without delays from mechanical troubles."

Rush schedules call for top performance from every unit of equipment and freedom from costly and time-consuming mechanical delays. That's why a majority of leading contractors on all types of projects keep a Gulf Service Engineer "in the picture" and adopt his recommendations for the proper lubricants and fuels.

Gulf Service Engineers give valuable assistance on hundreds of jobs by applying *know-how* based on years of training and practical on-the-job experience. They help keep contractors' equipment operating efficiently under all kinds of conditions—and maintenance costs at rock-bottom levels.

Call in a Gulf Service Engineer before you start your next job—he will help you complete it more quickly and at a larger profit. Write, wire, or phone your nearest Gulf office today.

GULF

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GULF BUILDING, PITTSBURGH 30, PA.

SIMPLIFIED

inside and out!

Offset soft rubber handle grips, positioned for better balance.
Patented locked-pawl construction, for easy dismantling and assembling.
The exclusive, patented Sullivan Duri-Valve, completely controls the admission and cut-off of air to either end of the piston independently. Air is used more efficiently and a definite "cushion-control" is set up.
Oil reservoir has four-hour capacity. Pawls, rotating mechanism, valve, cylinder, piston flutes, chuck driver and chuck are lubricated adequately for all conditions.
Two-piece chuck, made from specially selected alloy steel, machined, heat-treated and ground to give maximum performance.
Throttle valve handle, conveniently located for the operator, screws into a tapered fit in valve hub, providing shake-proof construction.
Large, open exhaust eliminates freezing. Exhaust air stream is directed down from the operator and away from the cuttings.
Removable bronze liner in buffer ring, easily and economically replaced. Accurately ground to size, replacement assures original cushioning effect and piston alignment.
Buffer ring provides long, ground bearing areas to maintain alignment between cylinder and front head.
Full-line-pressure hole-blowing through a large port leading directly from throttle valve to drill steel.
Simple, rugged steel retainer, easily opened or closed. Eliminates troublesome bolts, nuts, lock washers and springs.

OTHER PRODUCTS

Portable Compressors • Stationary Compressors • Rock Drills • Wagon Drills • Core Drills • Portable Hoists • Spaders • Paving Breakers • Trench Diggers • Sheeting Drivers • and other Pneumatic Tools.

THE clean, simple lines of the Sullivan L-57 Rock Drill suggest an ease of handling that appeals to any drill runner. Inside, the L-57 has the same simplicity of design and construction, the result of experienced engineering. Any drill doctor knows that a drill like this lasts longer and does a better job. Every detail of construction on the L-57 points toward lower maintenance and more footage drilled.

The nearest Sullivan distributor or branch office can furnish complete information on the L-57 or other Sullivan equipment for contractors. Sullivan Machinery Company, Michigan City, Ind. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.

SULLIVAN

OFFICES

Birmingham • Boston • Butte • Chicago • Claremont • Dallas • Denver • Duluth • El Paso • Huntington • Knoxville • Los Angeles • Middlesboro • New York • Pittsburgh • Portland • Salt Lake City • San Francisco • Seattle • St. Louis • Washington, D. C.

CONTRACTORS' EQUIPMENT PROVED THE WORLD OVER

SKILSAW

speeds every type of construction!

• Barracks, bridges, hangars, warplants . . . all wartime construction work got done faster when SKILSAW speeded the cutting of wood, compositions, stone and sheet metal. SKILSAW speeds every step—from cutting forms for concrete foundations to gang sawing of sheathing on the roof.

Just as SKILSAW'S speed in war hastens the day of Victory, SKILSAW'S speed in peacetime will mean faster, *more profitable building* for contractors everywhere. This isn't a forecast . . . it's a fact based on more than 23 years of experience among successful contractors who are using more than 100,000 SKILSAWS.

If your SKILSAW needs an overhaul for more efficient operation, take it to your nearest factory service station *now* for economical, authorized repair. If you have yet to own your first SKILSAW, ask your distributor today for a SKILSAW demonstration!

SKILSAW, INC.
5033-43 Elston Avenue, Chicago 30, Illinois
Sales and Service Branches in All Principal Cities

SKILSAW PORTABLE ELECTRIC TOOLS
MAKE AMERICA'S HANDS MORE PRODUCTIVE

A LETTER

THAT INDICATES THE KIND OF SERVICE YOU GET WHEN YOU BUY A NORTHWEST

GENERAL CONSTRUCTION COMPANY
337 SOUTH HIGH STREET
COLUMBUS, OHIO
ADams 7823

May 29, 1944

Northwest Engineering Co.
28 E. Jackson Blvd.
Chicago, Illinois

Gentlemen:

We wish to thank you for the prompt and efficient way you have taken care of our requests for repair parts.

Although the maintenance and repairs of our Northwest Shovels are the lowest of any shovel which we use, it is indeed gratifying to know that when an occasional repair part is needed, your firm has certainly co-operated with diligence and promptness. Considering the present times, that is certainly an achievement, of which you should be proud.

We believe that you not only have a good product, but also that you co-operate with the user from the time the product is sold and for as long as the user operates it, that, gentlemen is just as important as the quality of the product itself.

Thanking you,

Yours very truly,
GENERAL CONSTRUCTION CO.

L. A. Guzzo (Partner)

LAG/al

We never have been great believers in testimonial letters. We have always felt that anyone could secure a testimonial letter from his friends. But when this unsolicited letter from the General Construction Company of Columbus, O., came in it was so sincere, so gratifying and so indicative of the type of service we maintain for Northwest users that we decided it was worth your reading, too.

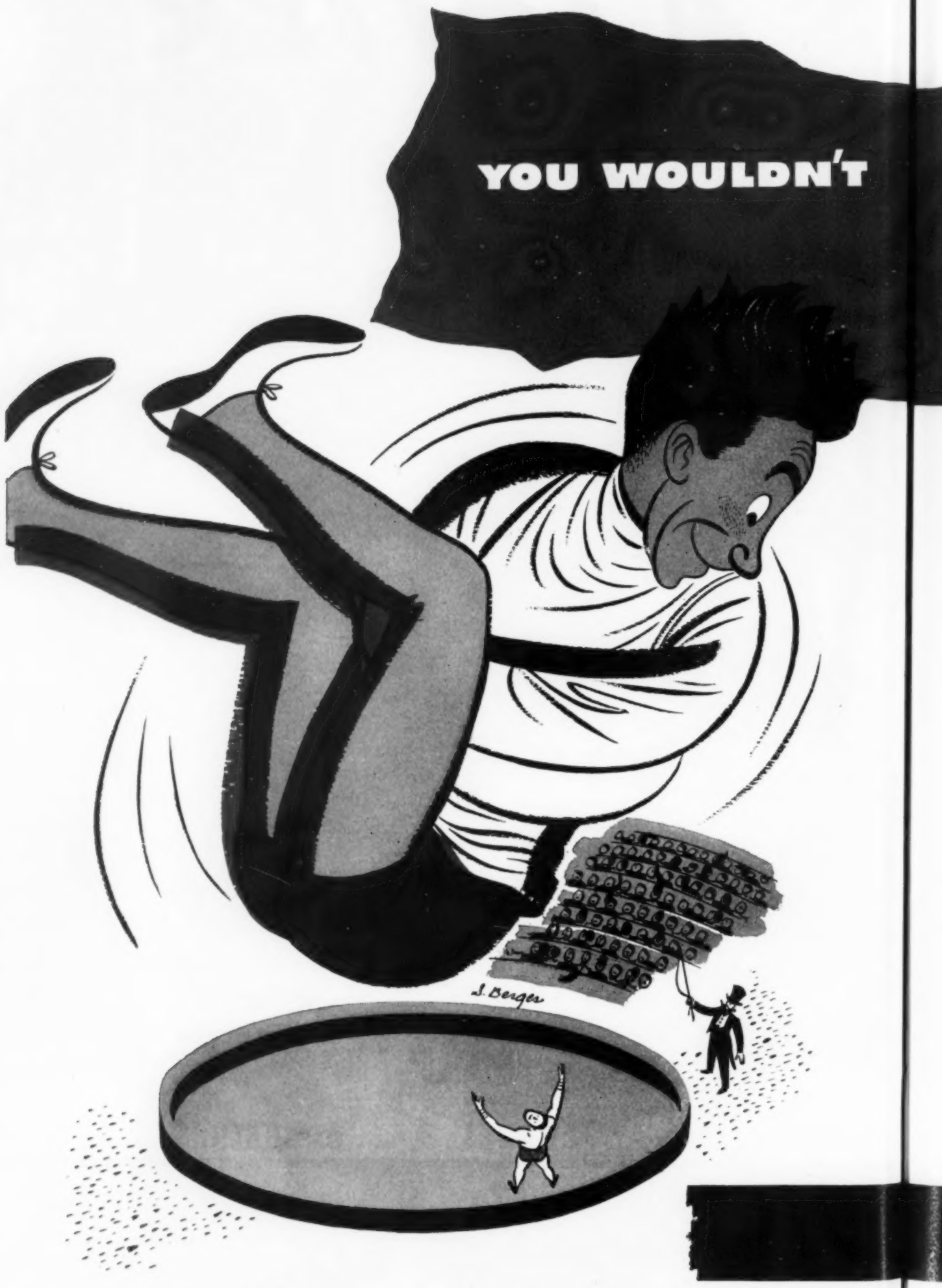
Remember Northwest never obsoletes a Northwest in service. You can always get parts for your Northwest no matter what the model.

NORTHWEST ENGINEERING CO.
1728 Steger Bldg., 28 E. Jackson Blvd., Chicago 4, Illinois

-and when you have a real Rock Shovel you won't have to worry about output in dirt

NORTHWEST

SHOVELS ..... CRANES ..... DRAGLINES ... PULLSHOVELS


YOU WOULDN'T
J. Berger

PUT A STRAIT JACKET ON AN *Acrobat*

LAY·SET PREFORMED *is free!*

Of course, this analogy is far-fetched. Any aerial acrobat dressed in a strait jacket would probably break his neck. But it is still true that the wires and strands of non-preformed wire rope are virtually in a strait jacket—locked in position and under constant stress—with the result that the rope doesn't perform as well nor so long as Hazard **LAY-SET**, which is preformed at the mill and entirely relieved of stresses and strains. **LAY-SET** Preformed wire rope gives you greater dollar value because it requires no seizing when cut; it resists kinking and whipping; it is easier to splice, faster to reeve and safer to handle. Since it is endowed with high fatigue resistance, it wears longer.

Hazard **LAY-SET** Preformed Wire Rope is "in the service" on countless jobs for the Armed Forces where it is proving its many advantages. Specify it for *your* use.

HAZARD WIRE ROPE DIVISION · Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma
AMERICAN CHAIN & CABLE COMPANY, INC. · BRIDGEPORT · CONN.

ARMY (E) NAVY — GREEN SIGNIFIES SAFETY

HAZARD LAY·SET *Preformed* WIRE ROPE

POINTS YOU HAVE ASKED ABOUT AIR COMPRESSORS ... BEFORE GETTING A SCHRAMM

DURABILITY?

A big point. Schramm Air Compressors are rugged ... suitable alike for rough, rocky travel and for soft muddy places ... withstand wear and tear.

VERSATILITY?

Versatile—yes! Power and Engineering Companies use Schramm for laying conduits and cables ... digging post-holes ... operating pneumatic drills and hammers ... breaking pavements ... supplying hoist, lifts, jacks ... cleaning engines and machines by jets ... plus many more uses.

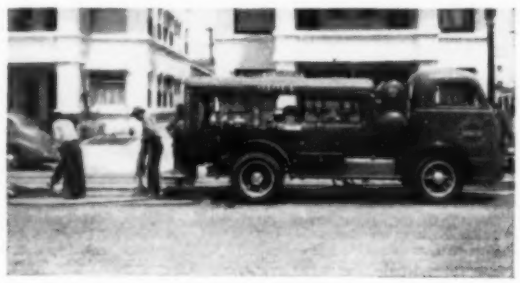
COOLING SYSTEM?

Ah, there's a feature! 100% watercooled, Schramm Compressors prevent overheating in summer, freezing in winter ... enabling them to work with doors closed (thus keeping out dust).

Schramm Air Compressors—both portable and stationary—are extensively used in general field service, generating stations, steam plants, repair shops.

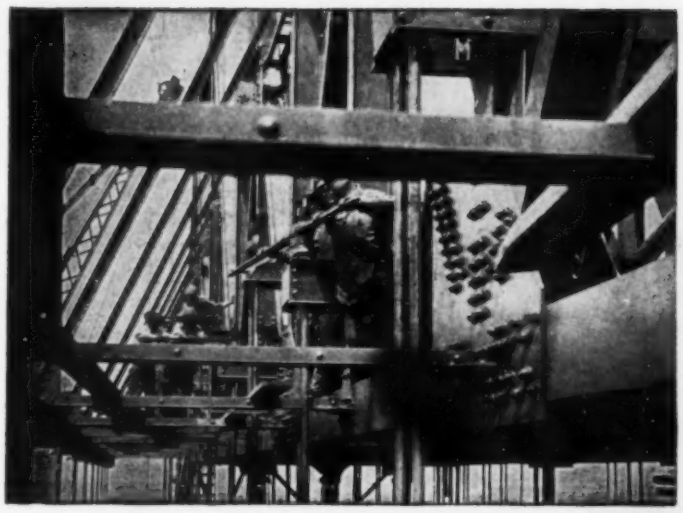
Outstanding features responsible for this widespread use are: completely watercooled ... mechanical cam-operated intake valves ... larger discharge in head ... forced feed lubrication, to every moving part, through oil lines drilled in metal ... main bearings for each cylinder ... vibrationless ... safe, fast starting by push button ... compact and lightweight!

Get air when you want it by using a Schramm. For further details write for Booklet Pub-44.



SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA



For Speeding HIGHWAY Bridges

Wherever BOLTS Need Tightening

On a concrete pontoon bridge across Lake Washington at Seattle, the joint bolts were tightened with a LOWELL WRENCH. (Picture to the right, above.) The 4-part line delivers 4000-lb pull at the end of the wrench handle.

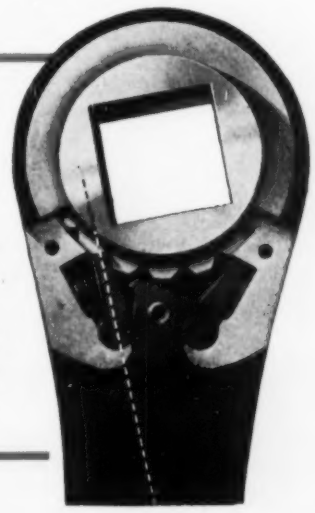
This illustrates how the LOWELL WRENCH, with its straight-line application of power, withstands a terrific load. See below how they are built.

LOWELL WRENCHES stand up for many years in heavy construction service. Just now the War demands all of our output — but, with Victory, LOWELL WRENCHES will be available again for Highway Builders and all other Constructors.

Straight line

LEVERAGE . .

See how each pawl, when engaged, transmits leverage from the solid stock of the handle, direct to the gear in a *straight line* and with a square contact. The pawl is in compression only —no shear, no tension, no torsion. The shipper carries none of the load. This strong construction insures steady service.



75 Years Serving the Heavy Construction Industry

LOWELL WRENCH COMPANY

1869 WORCESTER, MASS., U.S.A. 1944

You Can Increase Your Tractor's Range of Uses . . . Give It Extra Work To Do

WHY NOT step up the usefulness of your present "Caterpillar" Diesel Tractor by equipping it with an Athey MobiLoader?

One or more of your present machines possibly has just completed a construction job—operating a bulldozer, or pulling a wagon or scraper and now stands idle. Is there some maintenance work, rebuilding or improving it could be doing?

You can keep your machines busy with the fast-working, cost-cutting Athey MobiLoader—the machine that has countless uses.

Athey MobiLoaders are backed by 4 years of performance in the field. They've piled up records of big production on loading operations of all kinds.

They're loading stock piled gravel, stone, rock, coal, ore, earth, snow and other materials quickly and economically. They're working in gravel pits—on coal stripping operations—in ore mines—loading many materials in less time, at less cost.

Bucket capacities for the Model W4-1 MobiLoader range from 3/4 to 1 1/8 cubic yards; Model 8 MobiLoader has bucket sizes from 2 3/4 to 4 1/2 cu. yds., depending upon the type of material.

Used by the Armed Forces on battle fronts in every theatre of war, they're sold and serviced by the world-wide "Caterpillar" dealer organization which has no equal.

MOBILOADERS

ARE AVAILABLE FOR

"CATERPILLAR"

D4 & D8

TRACTORS

★

SEE YOUR DEALER

You get big-capacity, high-speed loading with the proved overhead Athey MobiLoader, plus ample crowding action for digging

Ask your ATHEY-"Caterpillar" Dealer, or write direct to Athey Truss Wheel Co., 5631 W. 65th St., Chicago 38, Illinois, for further information.

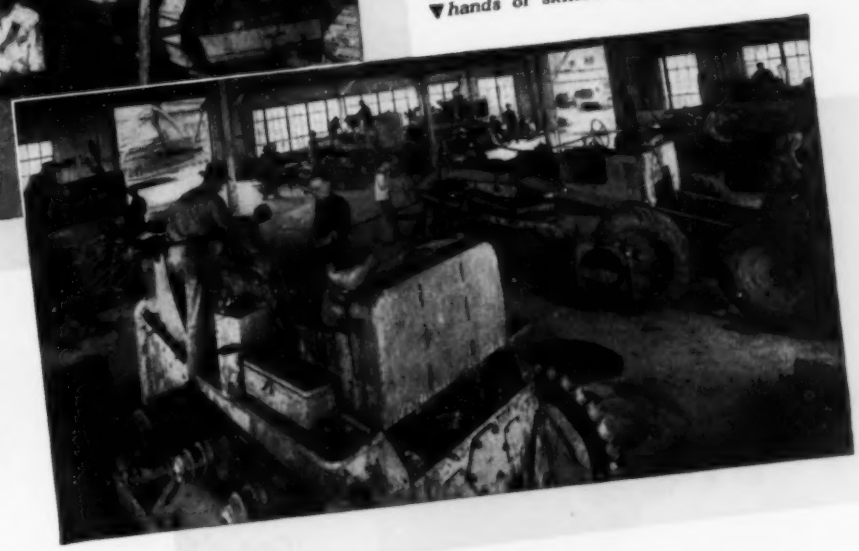
ATHEY

FAST, DEPENDABLE LOADING EQUIPMENT

Their business is to help keep your business going

◀ *Big, well-equipped service shops enable "Caterpillar" dealers to offer their customers the last word in maintenance and repair service.*

In this dealer's repair shop, every kind of "Caterpillar" equipment receives the attention it needs in the ▼*hands of skilled mechanics.*



DO YOU HAVE "IDLE" EQUIPMENT?
The War Production Board wants to locate usable track-type tractors, motor graders, cranes, shovels—vitally needed by mining, logging, oil-field, agriculture and other industries. What can *you* spare —to rent or sell? If you don't know where to contact your regional WPB officials, your "Caterpillar" dealer will gladly direct you and give you further details.

"CATERPILLAR" owners are fortunate in having a dependable service-dealer organization to which they can turn for expert inspection, adjustments and repair work at a time when obtaining new equipment is virtually out of the question—except for the most essential needs.

That your "Caterpillar" dealer is able to provide such services, despite the fact that his showrooms may be empty, is due to sensible long-range planning. His dealership has been established on the sound principle that doing business successfully is not alone a matter of making sales, but of *keeping sold equipment in good operating condition—come what may.*

During the long war years, your "Caterpillar" dealer has been steadily on the job—geared to come through for you. In fact, his shop is likely better equipped to serve you than ever before, with more factory-trained service men, finer equipment and the latest methods to save time, money and war-critical materials in keeping your machines at work. His desire now, as always, is to make your business more profitable and he is equipped to make that wish come true.

Have your "Caterpillar" service-dealer go over your equipment *now*—for inspection, adjustments, and replacement or repair of worn parts. In this way, not only can your operating costs be kept at a minimum, but the life of the equipment can, most likely, be prolonged by thousands of hours.

• • •

CATERPILLAR TRACTOR CO., PEORIA, ILL.

THE "FIGHTING FOUR"

INSPECT Look your equipment over frequently. For expert "internal" inspection of operating parts or functions, call in a trained "Caterpillar" service man. Read your Operator's Instruction Book.

LUBRICATE Use the right oil at the right time in the right place and in the right quantity. Keep the oil clean—change before it becomes dirty and deteriorated. Follow the Operator's Instruction Book.

ADJUST Tighten all bolts. Keep fan belt and tracks at proper tension. Read the Operator's Instruction Book. For fuel injection valves and other precision adjustments, let your experienced service-dealer do the work. He'll do it well.

REPLACE Have your service-dealer replace or repair worn bearings, track rollers, pins and bushings, sprockets, cylinder liners, clutch linings. His service helps restore power and extend equipment life. Saves critical materials, too.

DEPENDABLE is the word for "Caterpillar" dealers

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

TRACTORS • ENGINES AND ELECTRIC SETS • EARTHMOVING MACHINERY

More work... lower cost
THANKS TO LA PLANT-CHOATE "KNOW HOW"

Above: This crude, hand-operated LaPlant-Choate dozer was developed in 1923 for use on the famous Dixie Highway in Kentucky. Modern hydraulic and cable operated models offer numerous improvements in blade design, operating features and all around dependability.

DID YOU KNOW that the first LaPlant-Choate bulldozers were built for Best and Holt tractors long before the days of "Caterpillar" . . . that LaPlant-Choate pioneered the first production dozer with hydraulic control (1925) . . . a dozer with an angling blade (1927) . . . a tilting blade (1929)? Did you know that LaPlant-Choate engineers developed the first lightweight dozers and scrapers to be flown in transport planes (1942) . . . and the first dozers to be used successfully with Army tanks (1943)? Did you know that last year, according to official WPB figures, LaPlant-Choate built over 33% of all the dozers produced in the United States by 18 different companies . . . and that LaPlant-Choate now controls over 15 patents covering basic improvements in dozer design?

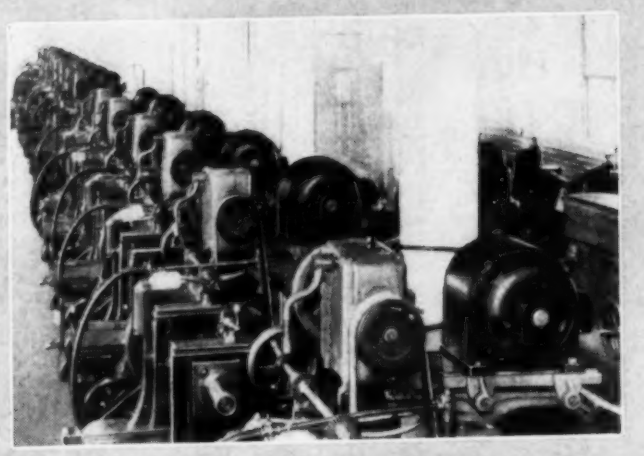
One of the main reasons for the world-wide popularity of LaPlant-Choate dozers is their proved ability to do *a better job at lower net cost.* In other words, when you buy a LaPlant-Choate dozer, you get more than just a blade in front of a tractor. You get an "engineered unit" developed and improved through *21 years of field experience* with thousands of LaPlant-Choate dozers in all parts of the world. Moreover, as one of America's largest suppliers of dozers to the armed forces, LaPlant-Choate is gaining additional experience that assures you of *even better performance* from LaPlant-Choate dozers in the future. So before you buy any new dozer equipment, be sure to get complete facts on LaPlant-Choate's new, improved line—with *either cable or hydraulic control.* LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

ARMY (E) NAVY

LAPLANT-CHOATE

Earthmoving and Land Clearing Equipment

BEARINGS BEAR UP

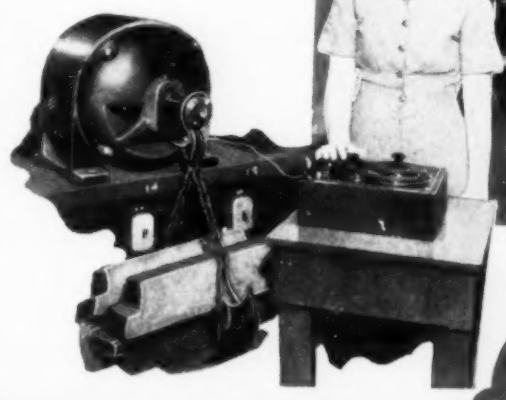


Powered by Tri-Clad sleeve-bearing motors, this battery of milling machines has been in round-the-clock operation on war work since before Pearl Harbor. The short-center, hinge-base drives put a hard, steady pull on the motor bearings. In addition, the machines are in the hands of several different operators each day, many newly trained. Despite the severe service, motor-bearing performance has been above prewar levels. Maintenance manpower has been conserved, and production held on schedule.

Tri-Clad motors driving milling machines in the River Plant Division of the Savage Arms Corp., Chicopee Falls, Massachusetts.

How torture tests on TRI/CLAD bearings have helped us lengthen motor life

Before the Tri-Clad motor-bearing designs were adopted, many models of this new motor were tested to destruction under heavy shaft loadings applied from all directions, with various kinds of lubricants, and under many different speed and temperature conditions. As new Tri-Clad types are introduced, these tests continue—some for years—in "torture" areas such as shown at right. Each test broadens our knowledge, offers new clues to longer motor life. Throughout industry, results have substantiated the improved bearing performance forecast by these tests. *General Electric Company, Schenectady 5, New York.*



GENERAL ELECTRIC

TRI/CLAD MOTORS

Buy all the **BONDS** *you can* — **AND KEEP ALL YOU BUY**

what is "RELAXED" wire rope . . ?

Every time you run a length of non-preformed rope over a small sheave or drum, you create a high degree of bending fatigue that shortens the life of the rope.

In contrast, when you use Bethlehem Form-Set in your clamshells, derricks, cranes, and power shovels, you've got rope that's "relaxed" because it's been made by the preforming process. Form-Set Rope is flexible . . . unusually free from built-in torsional stresses.

Where it is necessary that sheave and drum ratios be small, these characteristics are especially desirable, for they mean smoother spooling, longer rope-life, smaller maintenance costs, and a lot less trouble-shooting.

Besides the Form-Set feature, you'll want Bethlehem's Purple Strand grade of rope for lifting and earth-moving work. Purple Strand is Bethlehem's top quality —made of improved plow steel—and that means it's as fine a rope as you can buy anywhere.

When you think WIRE ROPE

. . . think BETHLEHEM

Making friends of road builders for 40 YEARS

Road building was an infant industry in 1904. That was the year America constructed its first Texaco Asphalt road surface.

What happened during the 40 years which followed is significant to anyone interested in road materials. Not only have those years seen road builders in every State east of the Rockies use Texaco Asphalt, but foreign road builders in countries scattered all over the globe have followed suit.

Texaco Asphalt shipping points have increased gradually until, under peacetime conditions, they are able to deliver asphalts quickly everywhere between the Atlantic Ocean and the Rockies.

When you plan post-war projects, keep in mind that Texaco Asphaltic products cover a wide range of uses in road, street and airport construction and that Texaco Engineers, who are Asphalt specialists, are at your service.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd St., New York City 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

TEXACO

TEXACO ASPHALT

OLIVER RIVETS

Dependable Fasteners for Structural Steel

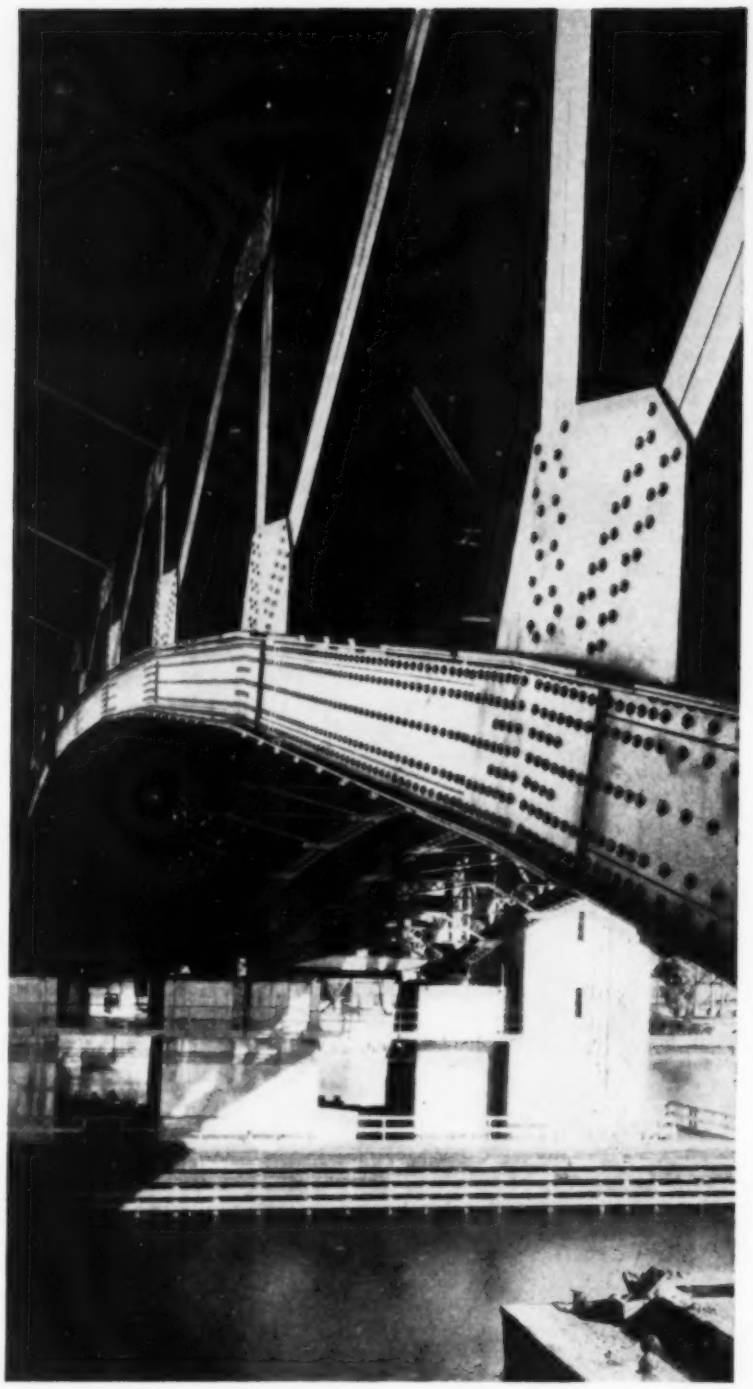
For fast erection and tight joints, choose your rivets with care! The full economy and basic dependability of the rivet are made doubly sure when you specify OLIVER. Round, true shanks, accurate sizes, uniform materials mean faster driving, stronger joints, greater all-around satisfaction.

Oliver rivets are made by one of the largest and oldest firms in this business. Our modern equipment and methods assure uniform production of highest quality rivets in all commercial sizes and head types.

As an aid to faster erection NOW, and dependable joints ALWAYS—specify OLIVER!

Other Oliver products used by the engineering construction industry are: fitting-up and other bolts, drive and screw spikes, pole line materials, special fasteners.

OLIVER
IRON AND STEEL
Corporation
Makers of Pole Line Materials
Since 1894
PITTSBURGH, PA.



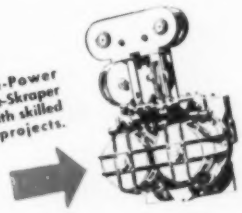
a HIT

WITH EXPERIENCED OPERATORS

"Today it is still the favorite unit on the job", is the way one operator expresses his individual enthusiasm for his Isaacson Kable-Power Unit. Acquired before Pearl Harbor, it is giving continuous service on gruelling construction work in the Pacific Northwest. "It's the best, yet", says another who operates a fleet of cable units. These are people who know equipment, value dependability, smooth operation and long service. The heart of cable operation to them is in the Cable Power Unit. A unit that holds its adjustments longer, eliminates tedious tuning-up periods, is simple in design and sturdily constructed is a big hit in these days of war time stress and crushing demands on tractor equipment. They can depend on their Isaacson Kable Power Unit. It won't let them down.

Front mounted Isaacson Kable-Dozers give constant power although tractor master-clutch is disengaged and they allow rear end to be free for rear power-take-off equipment.

16 AWARDS IN WAR PRODUCTION



Isaacson "Model HHL" Kable-Power Unit is rear mounted for Kable-Skraper operation and is another "Hit" with skilled operators on earth moving projects.

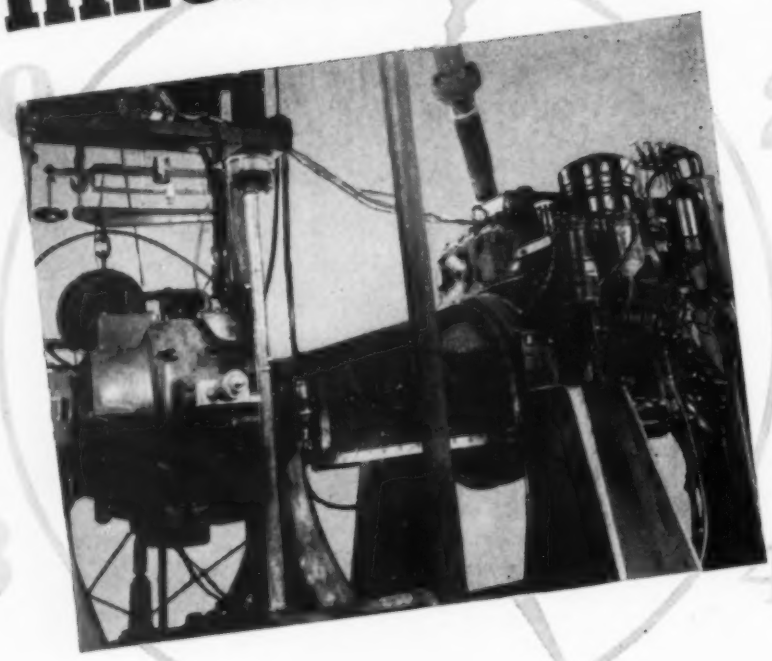
See your industrial Tractor Dealer, he is qualified to assist you with your tractor equipment problems.

ISAACSON
Iron Works
SEATTLE

ENGINEERED TRACTOR EQUIPMENT

41 times around the clock!

This 500-hour test (41 times around the clock) is described below.



Engine tests show Stanolube HD will reduce deposits and maintenance

A MOTOR OIL must pass many actual engine tests to meet the requirements of a truly heavy-duty oil. Most of these tests are far more severe than any service an oil will get in your equipment.

Some of these tests are described at the right. They are designed to duplicate, at a highly accelerated rate, all the destructive forces that tend to cause oil failures and resultant engine troubles.

Stanolube HD rates far above average in all these tests. No motor oil consistently rates as high as Stanolube HD in *all* qualities which a heavy-duty oil *must* have.

To find out what this means in reduced carbon, varnish, and engine deposits—fewer overhauls and lower maintenance—let a Standard Oil Automotive Engineer help put Stanolube HD to work in your fleet. Call your nearest local Standard Oil Company (Indiana) office, or write 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you. In Nebraska, write Standard Oil Company of Nebraska at Omaha 2.

Recognized tests of Heavy-Duty oil

1 **500-hour endurance test** in a high-speed, two-cycle Diesel engine. This test determines the ability of an oil to eliminate ring sticking, piston skirt deposits, port fouling, and bearing corrosion. This 500-hour test is equivalent to operating a truck under a *full load* for 30,000 miles.

2 **480-hour endurance test** in a medium-duty Diesel engine. This test measures the ability of an oil to reduce wear, deposit accumulation, and ring sticking under long-time service conditions.

3 **Scratch test** in a Diesel engine measures the load carrying ability of an oil under run-in conditions.

4 **"Hot-Box" test** measures the protection an oil gives against bearing corrosion in Diesel engines under conditions most conducive to corrosion.

5 **36-hour accelerated stability and bearing corrosion test** evaluates these characteristics of an oil under severe overloads at high temperatures.

heat-proofed **Stanolube H D**

Gasoline Powers the Attack . . . Don't Waste a Drop!

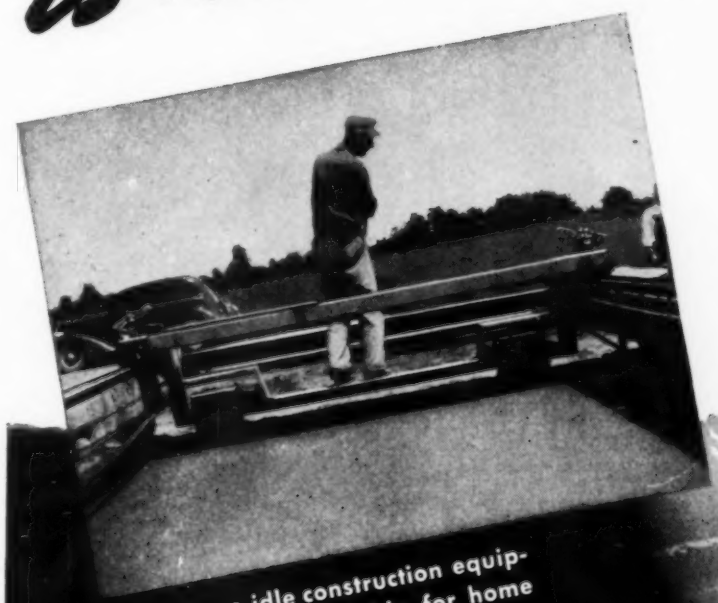
STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ FLEET CONSERVATION SERVICE

KOEHRING FINISHED SLAB

is Accurately Finished

AT ANY PAVER SPEED



If you have idle construction equipment, make it available for home front use, where it is urgently needed. Register all your idle equipment with the local office of the War Production Board.

Mechanical slab surface finishing assures absolute accuracy for the final finish. With the Koehring Longitudinal Finisher, the slab surface is in exact accordance with the specifications, because the screed travel is mechanically adjusted. It cannot vary at any time. Errors in slab thickness are immediately detected, form settlement at joints is equalized. High spots are removed and low spots filled by the Longitudinal Finisher without changing the density of the concrete. Be sure you are meeting the specifications . . . use the Koehring Finisher on your job.

KOEHRING COMPANY
Milwaukee 10, Wisconsin

HEAVY-DUTY CONSTRUCTION EQUIPMENT

Hats Off

TO THE CONSTRUCTION MACHINERY BUILDERS

When history properly rates the equipment used in winning the war, American made construction machinery will be given high rank. In fact, already some military men class such equipment as important as the strictly military equipment.

A marine yelled: "I saw him. He jumped into a cave over there in the rock quarry." Several other marines ran toward the quarry—one of several dozen on Saipan. Caves in the sides of these scooped-out affairs are favorite hiding places for Japs. Then began the familiar game of "flush the sniper." almost invariably there are five to 20 Japs in whatever hole you might expect to find one.

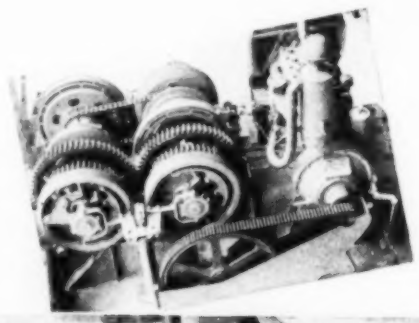
An armored bulldozer, piloted by a young Seabee, rumbled through the underbrush.

He went around to another side of the cave and dipped his blade into the earth. This time he found soft dirt. He scooped bladeful after bladeful against the mouth of the cave until it was blocked with at least a five-foot thickness of earth.

The sturdy men (with rifles slung over their shoulders) who operate the construction machinery on vital fronts have performed miracles,—built air strips, roads, campsites, embankments,—erected buildings and bridges, dug drainage ditches, —under the most adverse conditions imaginable.

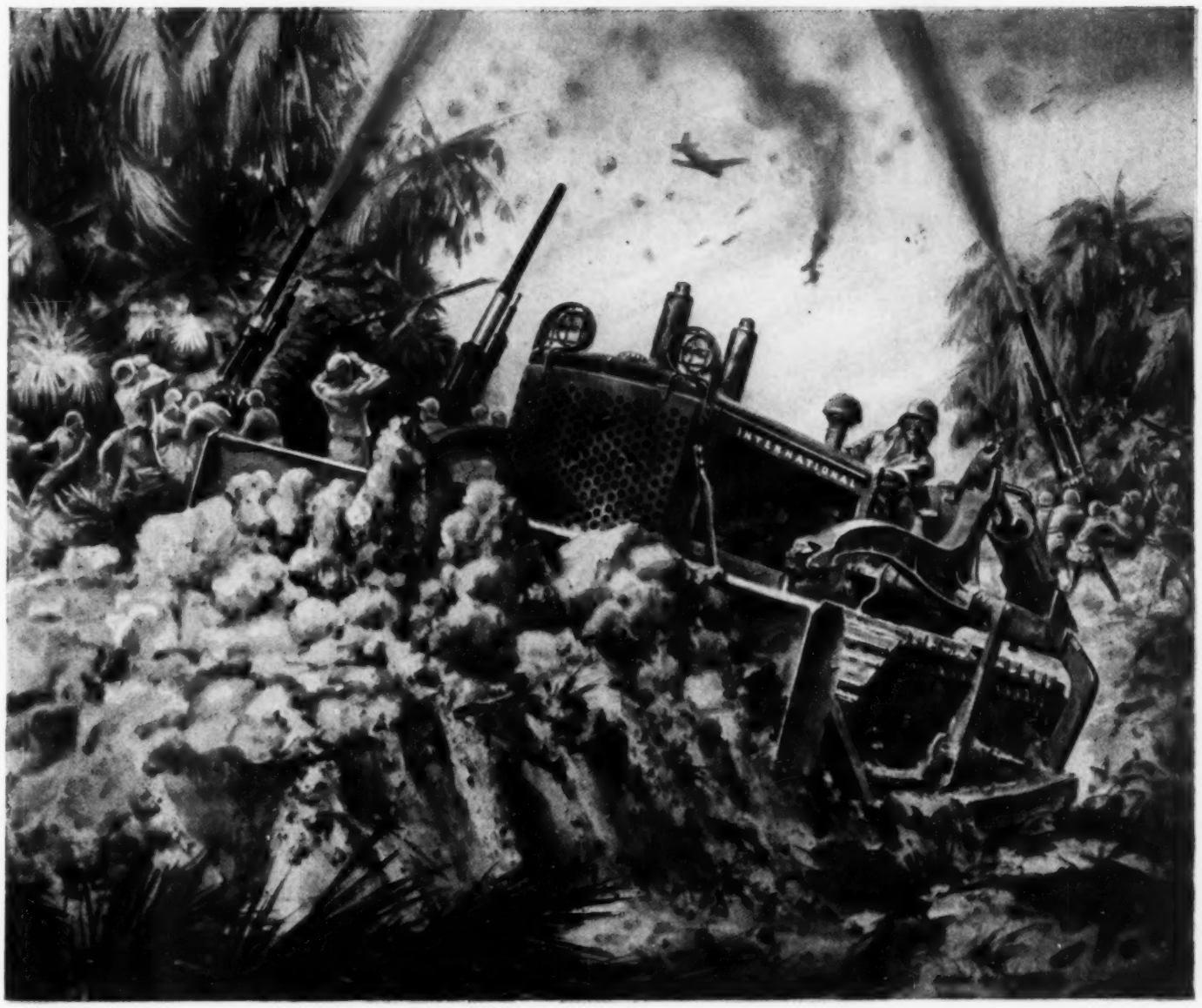
America owes much to these men and the machinery designers and builders who were ready with equipment far better than that of any nation on the globe.

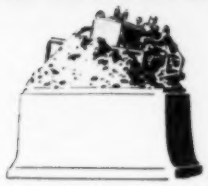
To have served leading makers of this rugged equipment before and during the war, has been a privilege. That the great reserve strength, dependability and long-life efficiency of DIAMOND Roller Chain Drives may have helped in accomplishing essential war-time jobs is a matter of great appreciation.



Again we say, "Hats Off" to the designing engineers and builders of construction machinery,—and the great crews that man them. DIAMOND CHAIN & MFG. CO., 418 Kentucky Avenue, Indianapolis 7, Ind. Offices and Distributors in All Principal Cities.

DIAMOND **ROLLER CHAINS**





TODAY
A JUNGLE

TOMORROW
A RUNWAY

WILL THEY EVER mount a Diesel Tractor alongside the cannon on a courthouse lawn to honor this great combat weapon? Anyway, it's an idea! For here's a peace-time builder that's a sensation on the battlefield, winning praises from GIs and Generals alike—moving dirt, rock, sand, frozen tundra and jungle swamp—by the ton and in a hurry.

Tens of thousands of International Tractors are serving the military—in the Army, the Navy, the Marine Corps and the Air Forces. Tractors pave the way for airpower, footpower and firepower . . . *All honor to the men who drive them!*

While these tractors are fighting on the battlefront, it's up to all tractor operators to conserve equipment here on the home front. *Make it last!* Harvester and the International Power Distributors stand ready to see you through.

If your need for new equipment is vital to the war effort, we will have equipment for you. If your need is less vital we will safeguard your present International Power with every service at our command.

And in the meantime, let's all remember that it's up to all of us to fight harder on the home front . . . fight on the food front—give to the blood bank—buy extra War Bonds—fight inflation. FOR VICTORY.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL HARVESTER

Power for Victory . . . Power for Peace

SMITH
THE T. L. SMITH CO. MILWAUKEE, U.S.A.

WINNING COMBINATION *for* POSTWAR PLANTS!

In your plans for postwar expansion, don't overlook this winning combination—*Smith Tilting Mixers* for pre-mixing or pre-shrinking concrete, and *Smith-Mobile Agitators* for delivering the pre-mixed or pre-shrunk concrete to the job. Both machines are PROFIT MAKERS with a record of performance that has never been equaled. Their maintenance cost is almost negligible. Write today for descriptive literature.

The T. L. SMITH COMPANY
2851 N. 32nd Street, Milwaukee 10, Wisconsin, U. S. A.

SMITH TILTING MIXERS

Famous all over the world for their fast charging, thorough "end-to-center" mixing and fast tilt and pour discharge. Ideal for central mixing plants because of low maintenance costs and rugged dependability, even when worked night and day. 4 sizes—from 1 to 4 cu. yds.

SMITH-MOBILE AGITATORS

Fast loading, smooth agitating, effective mixing and HIGH discharge. Fast pouring or slow controlled discharge, as desired. Large radius of spout distribution. Practically trouble-proof.

Equipment You'll be Proud to Own

SMITH-MOBILE

A 4475-1P

Shovels Are Weapons, Too

Basaltic cliff near Spokane, Wash., into which the Standard Asphalt Paving Company has tunneled to place Atlas free-flowing explosives in a "single T coyote hole."

The blast! The height of the trees beyond and above show lift as well as push.

75,000 tons of ballast neatly laid down. A fine feast for the shovel.

***Synergism:** *The force that produces "2+2=5" results when both you and we really get together and "click."*

Good Blasting Saves the Shovel—Cuts Costs

Consistently good blasting—which saves the shovel and cuts time, labor, and oftentimes explosives cost—doesn't "just happen." It's the result of properly analyzing the blasting problem—then using the right explosive in the right way.

In considering improved breakage it is well to study the characteristics of the explosive. For use in dry work, for example, consider the effectiveness of—

ATLAS FREE-FLOWING EXPLOSIVES

Flo-dyns and Canyon Bag, Atlas free-flowing explosives, are made by new and improved methods of manufacture. Packed in 12½-lb. bags, these explosives are easily loaded into coyote holes. Excellent pouring powders for use in vertical holes in dry work.

We would like to try synergistic* thinking with you in regard to your blasting problems. This intelligent exchange of ideas frequently produces blasting results far in excess of all anticipation.

ATLAS FREE-FLOWING EXPLOSIVES

GRADE	% Weight Strength	Velocity, feet per second, in the open 1¼" x 8"	Velocity, feet per second, confined in pipe, 1½" x 8"	MINIMUM NUMBER OF 8" CARTRIDGES PER 50 LBS. (MAXIMUM 10% MORE)
Canyon Bag	10	4600	5000	
Flo-dyn No. 2	20	5200	5800	1¼" 132
Flo-dyn No. 3	30	5200	5800	
Flo-dyn No. 4	40	5200	5800	Packed 4—12½-lb. bags
Flo-dyn No. 5	50	5300	6000	
Flo-dyn No. 6	60	5300	6200	per 50-lb. Case
Flo-dyn No. 7	65	5400	6300	

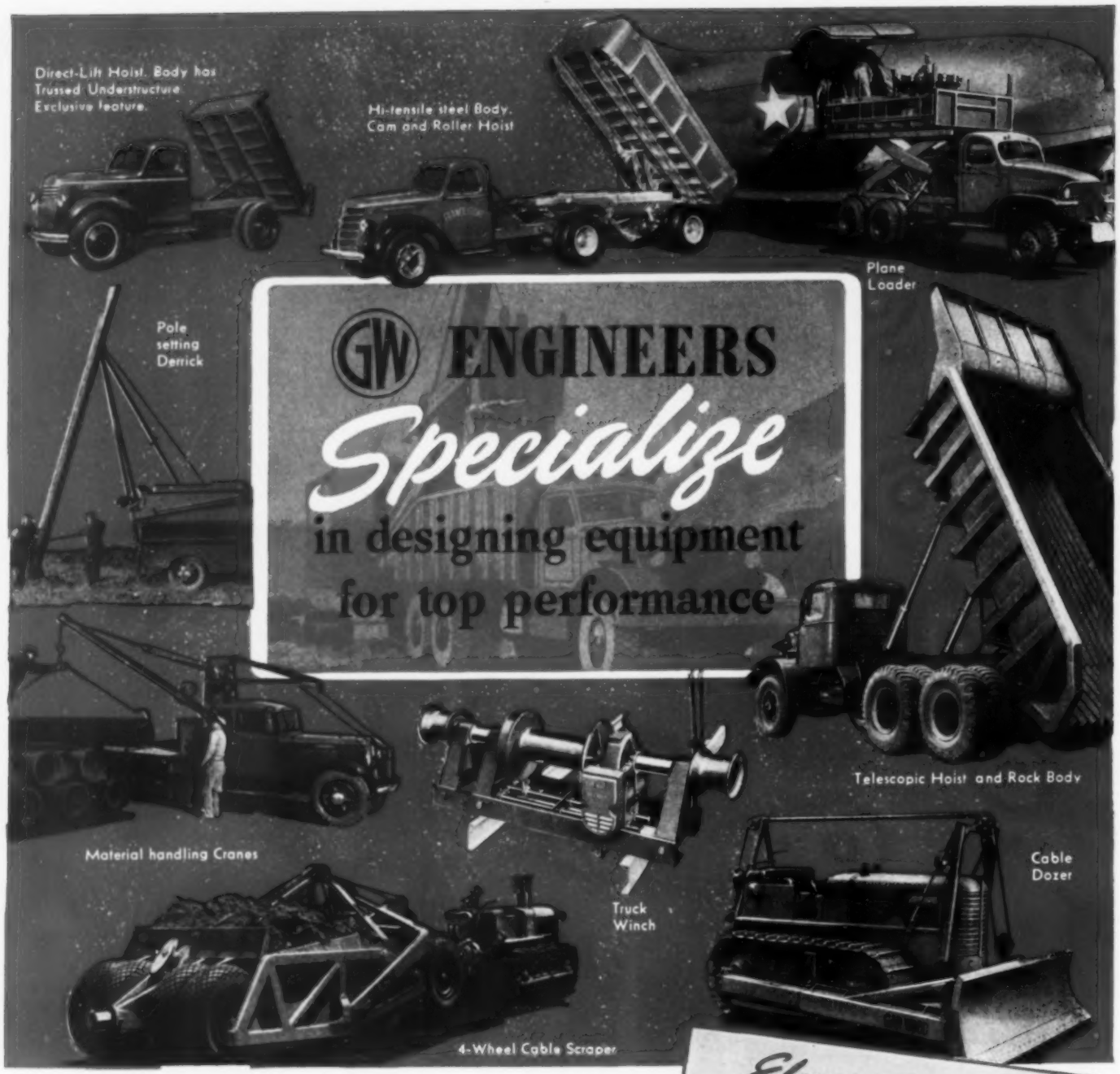
Flo-dyn: Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in Principal Cities • Cable Address—Atpowco



Gar Wood Industries, Inc., manufactures Truck and Trailer Equipment including Hydraulic and Mechanical Hoists, Dump Bodies, Tanks, Flushers, Sprinklers; Winches, Cranes, Pole Derricks, Power Take-Offs; also Road Machinery including 2 and 4 Wheel Hydraulic Scrapers, 4 Wheel Cable Scrapers, Hydraulic and Cable Dozers and Trailbuilders, Hydraulic and Cable Rippers and Tamping Rollers; also Heating Equipment and Motor Boats.

Gar Wood superior products are produced for a wide variety of uses and for every requirement.

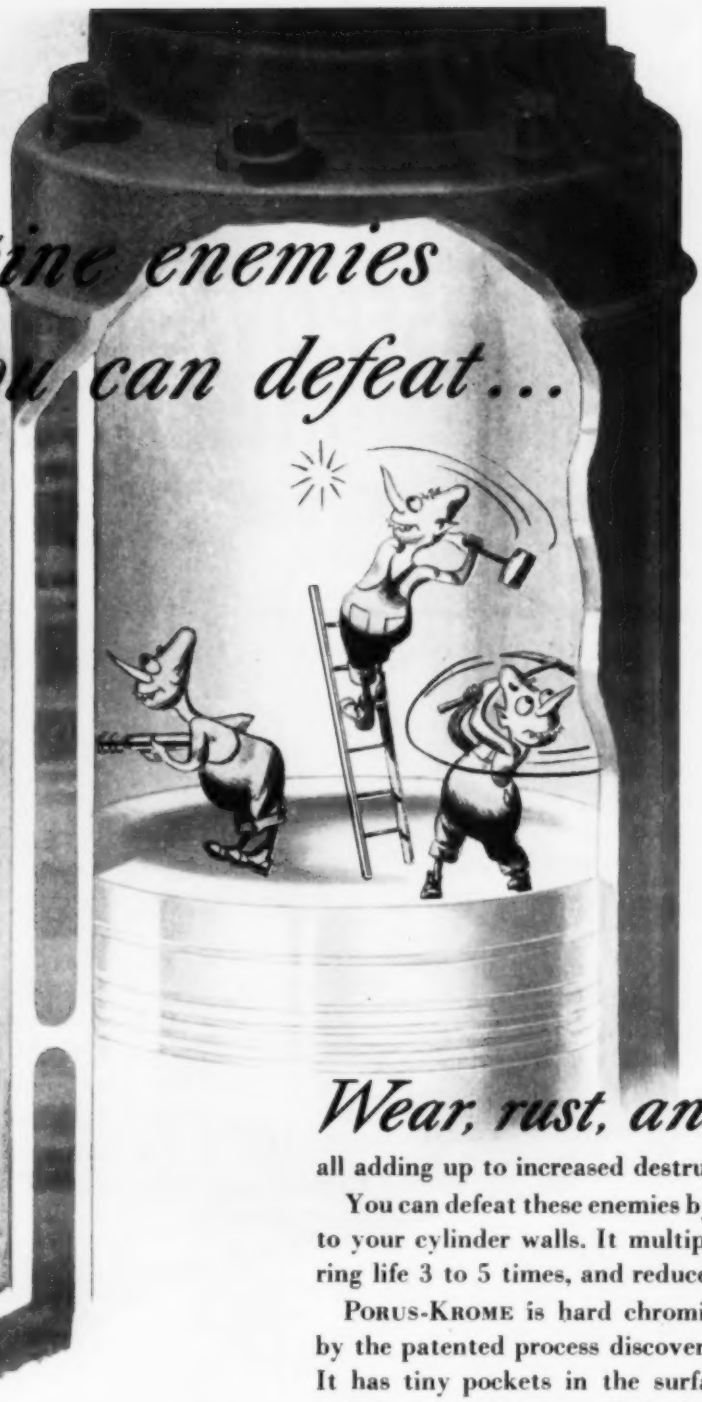
Eleven FACTORIES
Six DIVISIONS

HOISTS & BODIES
WINCHES & CRANES
TANKS
ROAD MACHINERY
HEATING EQUIPMENT
MOTOR BOATS

Branches and Distributors located in all Principal Cities

GW GAR WOOD
INDUSTRIES, INC., DETROIT
WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

3 engine enemies you can defeat...



Wear, rust, and sticking...

all adding up to increased destruction of your engine cylinders.

You can defeat these enemies by having PORUS-KROME applied to your cylinder walls. It multiplies cylinder life 4 to 20 times, ring life 3 to 5 times, and reduces the risk of scoring or scuffing.

PORUS-KROME is hard chromium, applied to cylinder walls by the patented process discovered by Hendrik van der Horst. It has tiny pockets in the surface which hold lubricating oil and feed it back as needed. And chrome's resistance to corrosion is well known.

While the process is new to most U. S. civilian engines, thousands upon thousands of engines have been treated with PORUS-KROME for use in the armies and navies of the United Nations. Here, where severe usage and constant operation make reliability all important, PORUS-KROME has proved its value.

You, too, can have this greater engine reliability. *Plan now* to specify PORUS-KROME in every engine you buy.

VAN DER HORST TRADE MARK

PORUS - KROME

Good for the Life of your Engines

VAN DER HORST CORPORATION OF AMERICA • OLEAN, NEW YORK • CLEVELAND 11, OHIO

AN AFFILIATE OF BREEDEN INDUSTRIES

Climax

provides

FAST, AGILE HORSEPOWER

for this 35-42 ton Industrial Brownhoist Locomotive Crane

This 35-42 Ton Industrial Brownhoist Locomotive Crane, built for the U. S. Army is equipped with a Climax R6I—166 hp., six cylinder engine.

● The quick accelerating abilities, high lugging capacity and enduring stamina of Climax Engines are qualities known to every user in the construction industry. Over 30 years of extensive research, field experience and technical refinement are incorporated into these modern heavy duty prime movers.

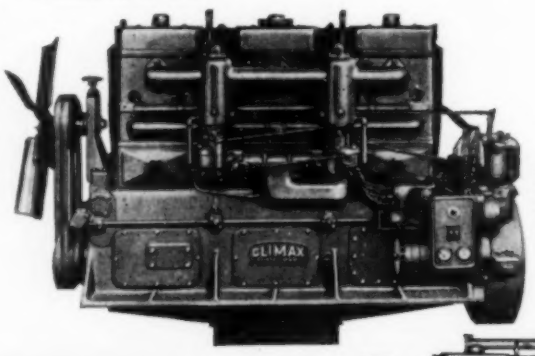
Climax Engines deliver maximum power on gasoline or butane. The valve-in-head design provides high efficiency, fuel economy and utmost accessibility. Smooth, quiet running, and freedom from destructive vibration result from the reinforced engine construction and balanced design. The crankcase is a rigid one piece casting, ribbed for extra strength, and the crankshaft is a precision-balanced heat-treated steel forging fitted with babbitt lined, bronze-backed bearings.

The Climax Blue Streak Combustion Chamber gives a faster pick-up and get-away at all speeds within the operating range. The particular shape of this patented combustion chamber, and the precise location of valves, improve gas mixing and cylinder scavenging. Thus, the tendency to detonate when sudden overloads are encountered is greatly reduced.

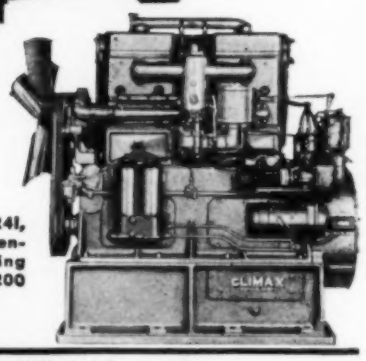
The wide speed range with close regulation, the ample cooling areas and highly efficient lubrication system of these engines give them a long effective life with minimum maintenance.

CLIMAX ENGINES are made in sizes up to 495 hp., in four, six, eight and twelve cylinder models. They may be specified for mobile or stationary service in outdoor or indoor locations.

WRITE TODAY for full information to Climax Engineering Company, 1807 South Fourth Street, Clinton, Iowa.



The Climax R6I, six cylinder engine, developing 166 hp. at 1200 r.p.m.



The Climax R4I, four cylinder engine, developing 120 hp. at 1200 r.p.m.

"For High Achievement in the Production of War Material".

Climax

Engineering Company

GENERAL OFFICES AND FACTORY: CLINTON, IOWA

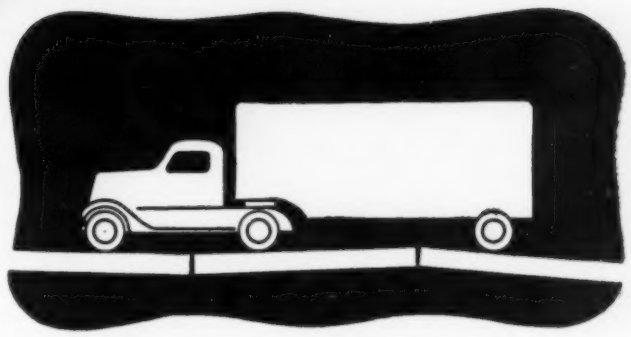
REGIONAL OFFICES: CHICAGO, ILLINOIS • DALLAS, TEXAS

Affiliated Companies:

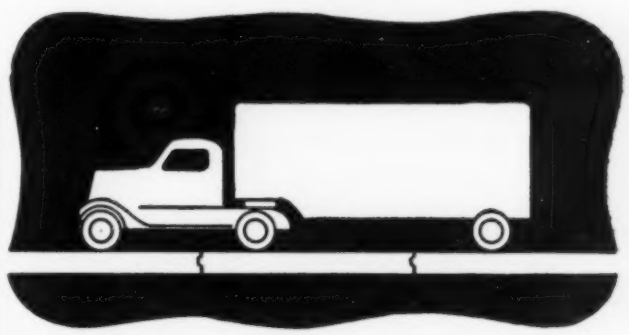
McAlear Mfg. Co., Chicago • Hanlon-Waters Co., Tulsa

Keystone **TONGUE AND GROOVE CONSTRUCTION**
GIVES MAXIMUM JOINT EFFICIENCY—USE IT
Longitudinally and Transversally

The Keystone of the pavement



Key your pavement slabs together—



Specify Keystone Tongue and Groove Joints

LONGITUDINAL JOINT EFFICIENCY

Average Values for Tests at a Number of Points
(Taken from *Public Roads*, August, 1939)

TYPE OF JOINT	Spacing of Tie Bars	Diameter of Bars	Joint Efficiency
	Inches	Inches	Per Cent
Triangular Tongue and Groove.....	60	½	75
* Rectangular Tongue and Groove....	60	½	78
Rectangular Tongue and Groove.....	None	—	50
Butt	24	¾	52
Butt	36	¾	42
Butt	48	¾	51
Butt	60	¾	47
Dummy	60	½	44
Dummy	None	—	39

* Keystone Tongue and Groove type joint

Send for illustrated specification manual showing methods of installation.

Keystone **ASPHALT PRODUCTS CO.**
A DIVISION OF AMERICAN-MARIETTA CO.

GENERAL OFFICE
43 E. OHIO STREET • CHICAGO 11, ILL.
MANUFACTURING PLANT • CHICAGO HEIGHTS, ILL.

PREMOULDED ASPHALT AND FIBRE EXPANSION JOINTS AND ACCESSORIES. JOINT SEALING COMPOUNDS AND CRACK FILLERS

Then he said to himself

"BEGINNINGS HAVE BEEN MADE!"

IN April when the Red Army had backed the Nazis beyond Soviet frontiers for the first time—Russia's Foreign Commissar Viacheslav Molotov announced:

> "In the full re-establishment of the Soviet frontier . . . beginnings have been made."

We now see the magnitude of affairs stemming from these simple beginnings.

Well he knew that the principal part of any project is the beginning.

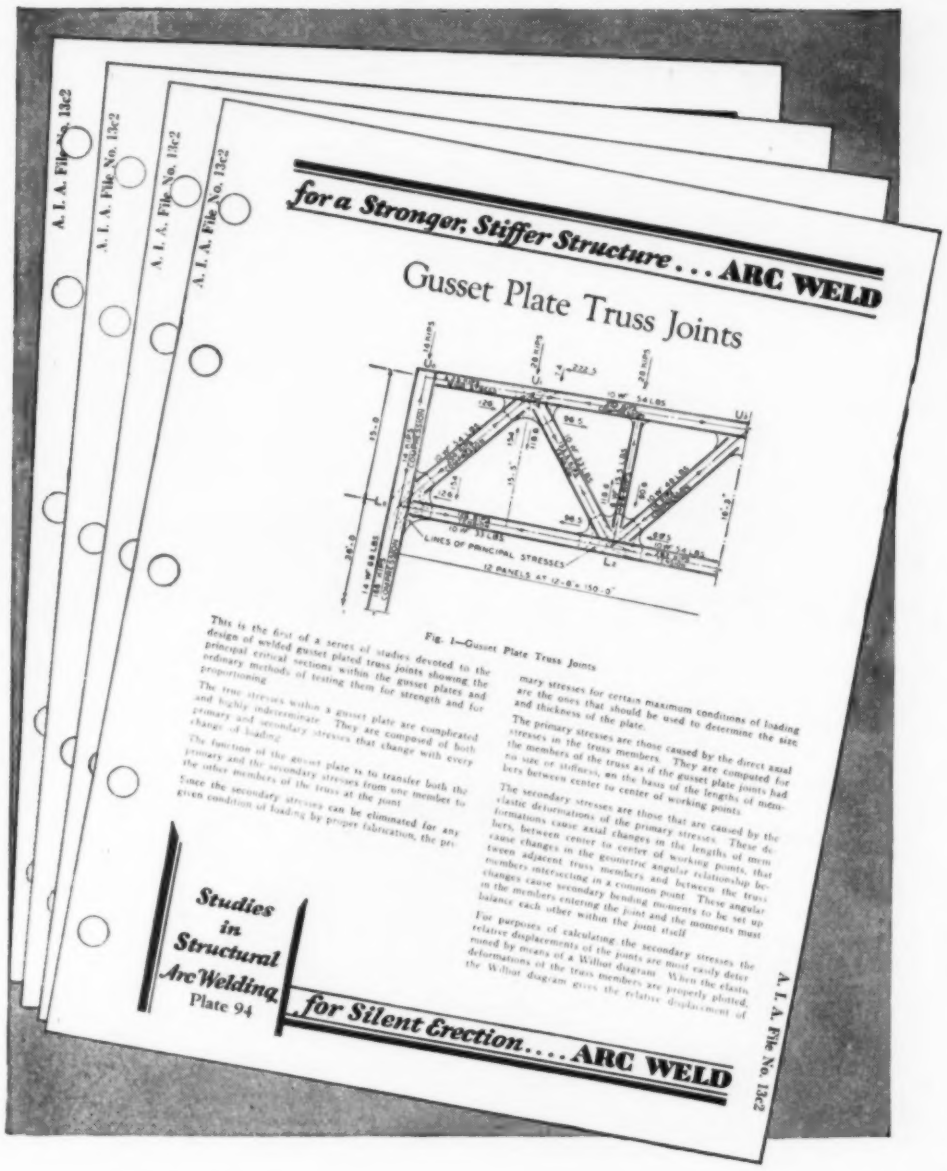
Well he knew that an improved beginning symbolizes an improved whole.

Well he knew that from such successful beginnings comes the ardor of pursuit.

This ardor of pursuit, well exemplified in Russian fields, symbolizes the beginnings of many American factories now preparing for the postwar invasion of markets.

"Beginnings Have Been Made"... *he says*

Look, Commissar, how a simple beginning can achieve a substantial ending in the field of engineering construction.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for a Stronger, Stiffer Structure . . . ARC WELD
Gusset Plate Truss Joints
Fig. 1—Gusset Plate Truss Joints
Studies in Structural Arc Welding
Plate 94
for Silent Erection . . . ARC WELD
A. I. A. File No. 13c2

KNOWLEDGE OF STRUCTURAL WELDING

to keep you abreast of this advancing method

HOW to design and build welded truss joints, rigid frames, beam-to-column connections, and other structural details, is the subject matter of this series of authoritative Lincoln Studies in Structural Arc Welding.

These studies, published regularly, contain design information which is prepared for engineers *by* engineers. Knowledge gained from these studies can help you take advantage of the many benefits of arc-welded construction . . . proved by use in ships, ordnance, aircraft and all kinds of structures during the war.

Sent *FREE* to architects, engineers, fabricators and contractors. Simply write us on your business letterhead and ask to be placed on the mailing list for "S.S.A.W. plates."

ALSO AVAILABLE: The "Procedure Handbook of Arc Welding"; total 1308 pages; 282 pages on structural design, containing previous studies over a 15-year period; price $1.50 C. O. D.

THE LINCOLN ELECTRIC COMPANY
Dept. EE **CLEVELAND 1, OHIO**

America's greatest natural **recourse**

ARC WELDING

what light weight pipe means

to a "HEAVYWEIGHT" contractor

Wartime jobs have given many a contractor a new impression of ARMCO corrugated metal pipe for drainage: culverts, storm and sanitary sewers.

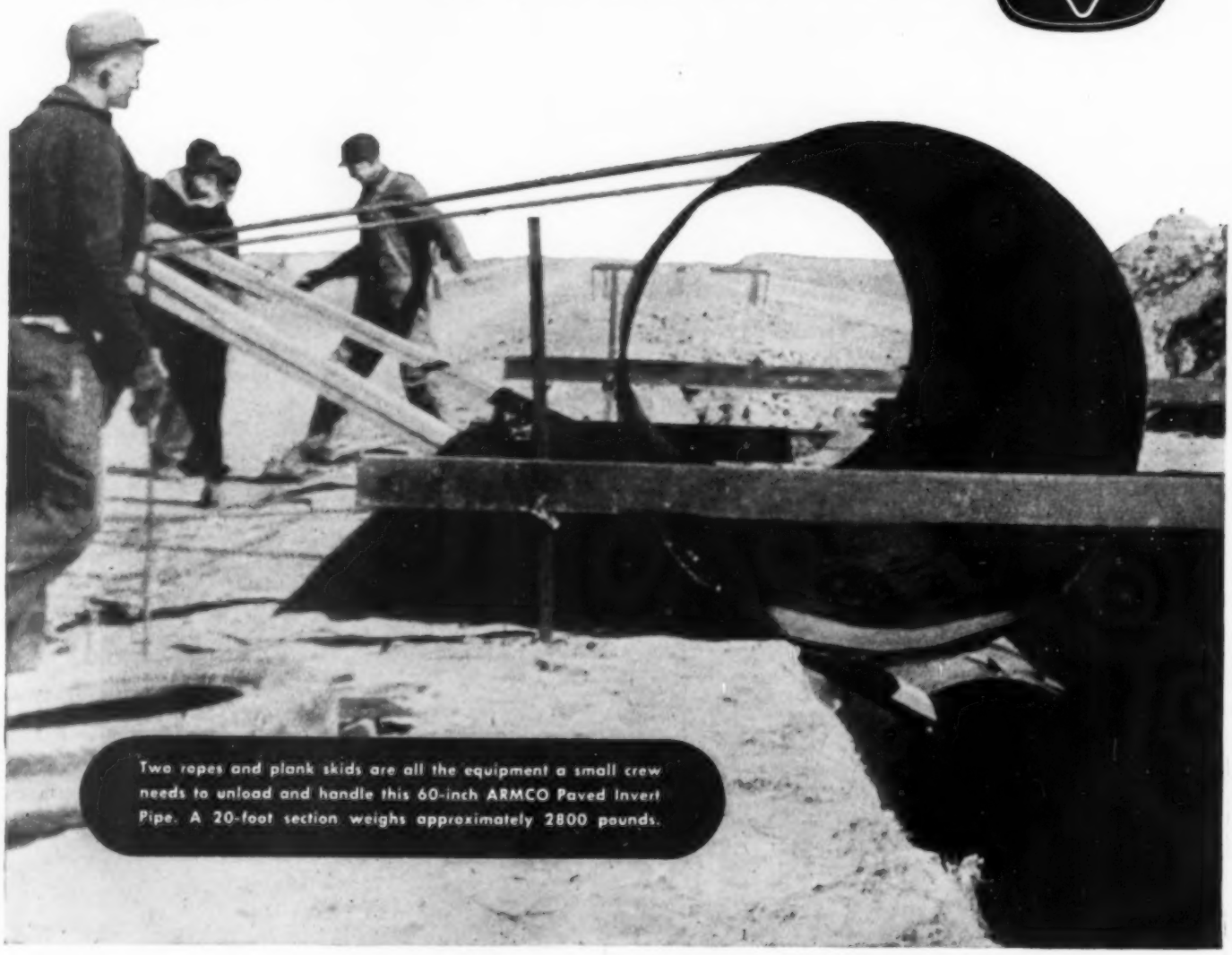
Although ARMCO corrugated metal pipe is light, it is exceptionally strong. Its longer lengths and fewer joints speed up work. Heavy handling equipment is not necessary.

Lighter weight also means fewer truck loads—only one-fifth to one-tenth as much as for other construction. Think of the savings in trucks, tires and men! You can afford to bid your drainage costs at a lower figure and yet make more profit.

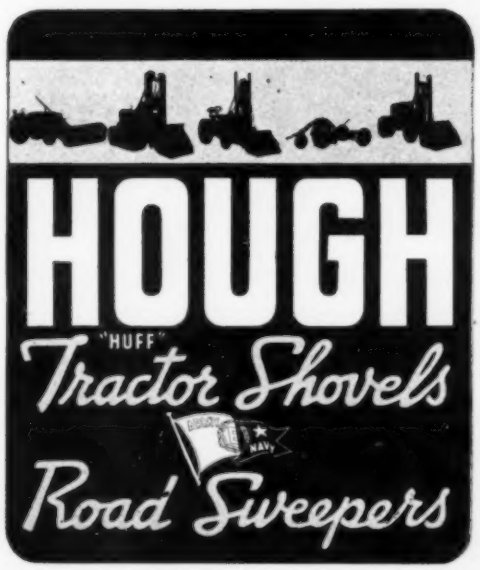
Add to all this the "know-how" of ARMCO drainage engineers and you have a product and service that will help you finish your contracts ahead of schedule. Ask the ARMCO man to show you the convincing facts and figures in "Corrugated Metal Drainage Structures in the War Program." Armco Drainage Products Association, 65 Curtis St., Middletown, O.

ARMCO

ARMCO PAVED INVERT PIPE



Two ropes and plank skids are all the equipment a small crew needs to unload and handle this 60-inch ARMCO Paved Invert Pipe. A 20-foot section weighs approximately 2800 pounds.



Hough Cable-Operated Shovel on an International tractor. Hough also builds hydraulic loaders and shovels for use on International wheeled tractors, and hydraulic and cable-operated loaders and shovels for use on crawler type Allis-Chalmers and wheel type Case tractors.

Hough Payloaders and Hydraulic Shovels have an enviable name—earned in hundreds of applications—for minimizing the time required to handle bulk materials. Their speedy performances in military service helped us to win our "E" flag. Still more gratifying to owners is the extent to which they reduce the time and cost of moving dirt, sand, crushed stone, snow and many other bulk materials.

Back of speedy and economical performance in picking up, carrying, loading and leveling is the field-proved design and construction experience of a quarter-century and more than 3,500 machines in service. The Hough hydraulic system is extremely simple and foolproof; the bucket automatically stops at its highest and lowest positions. Full operating control is centered in a single lever. The bucket can be dumped at any level. Correct design, weight distribution and inbuilt ruggedness account for the fact that many Houghs six, eight and ten years old are still in daily operation. Nationally known users operate fleets of up to twenty Hough Tractor Loaders.

A Few Typical Uses for Hough Tractor Loaders

***By Road Contractors:** for sub-grading, leveling, charging concrete mixers and black top machines, loading or spreading materials, trimming shoulders, digging basements, inside forms and under viaducts, etc.*

***By Highway Departments:** for road maintenance, loading stone, sand and gravel, loading from pits, stock piles, snow loading, etc.*

***By Counties:** for road maintenance, charging black top machines, handling sand and gravel, stock piling, snow removal, etc.*

THE FRANK G. HOUGH CO.

Libertyville, Illinois **"Since 1920"**

OVER 3,500 HOUGH TRACTOR SHOVELS IN SERVICE

HIGH EARLY STRENGTH
WITH
BUILT-IN CURING

EARLY STRENGTH THAT LASTS

. . . that's the real value of calcium chloride in concrete. Calcium chloride not only doubles the early strengths of concrete, but all tests show greater strengths at all ages tested over many years. Every particle of cement responds to this integral uniform curing reaction.

This simplest and most economical method of curing obviates the necessity of many inspections, and much equipment, material and labor are saved. The economies include the ability to handle a job with a much smaller investment in forms as they may be removed earlier for continued re-use. Calcium chloride also permits quicker, faster finishing, makes more orderly scheduling possible.

Many of these advantages, so very desirable in cold weather concreting, help speed the work the whole year 'round. Write for Bulletin 28, "Early Strength Concrete." It will be sent on request. Calcium Chloride Association, 4145 Penobscot Building, Detroit 26, Michigan.

FOR YEAR-'ROUND CONCRETING

USE CALCIUM CHLORIDE IN-THE-MIX

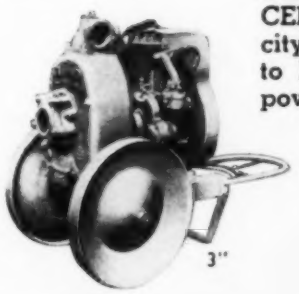
LOOK AHEAD WHEN YOU BUY

Guaranteed performance is *minimum* performance for JAEGER "Sure Prime" PUMPS

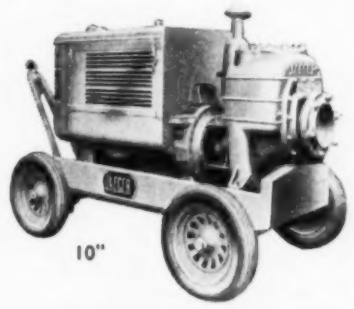
3000 Gallon "Bantam"

Contractors who watch their costs know there's a *big* difference between a Jaeger "Sure Prime" and an ordinary pump of the same size and rating. Jaeger Pumps are built to *exceed* their promises — deliver their rated capacity under tougher conditions, prime unfailingly and up to 5 times faster, assure you of thousands of *extra* hours of dependable cost-cutting service during the post-war building years ahead.

INDIVIDUALLY TESTED AND CERTIFIED for vacuum, capacity and pressure. Sizes 1½" to 10"; gas, electric or diesel power.



3"



10"

JAEGER DISTRIBUTORS in over 100 cities sell, rent and service "Sure Prime" Pumps.

LOOK AHEAD WHEN YOU PLAN

Jaeger's method of RE-MIXING ON THE SUBGRADE will meet tomorrow's specifications . . .

— the Spreading Screw does it!

Comparative tests by highway engineers have proved conclusively that the Jaeger Screw Concrete Spreader produces a more uniform and denser pavement slab.

By its thoro, positive re-mixing and inter-mixing of piles dumped on the subgrade, both segregation in the batch and the variations between batches are eliminated; badly placed batches are re-distributed to leave a uniform spread ahead of the Finisher; material is placed so solidly against road base and side forms as to eliminate the honeycomb problem and the entire mass compacted to a weight and density approaching that of vibrated concrete.

It is logical to expect that re-mixing on the subgrade will be specified to insure higher strength, longer life pavements.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

"FLEET-FOOT" CRANE-LOADERS

"SPEEDLINE" MIXERS

"SURE-PRIME" PUMPS

"AIR-PLUS" COMPRESSORS

JAEGER *Engineered* **EQUIPMENT**

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS, AGITATORS—JAEGER HOISTING ENGINES, TOWERS

PROVED HIGHLY SCALE-RESISTANT

under concentrated de-icing treatments

Minneapolis street and car-track test paving. After 5 winters of heavy applications of de-icing salts, sections laid with normal cement are badly scaled, while sections laid with Duraplastic are practically scale-free.

Minneapolis car-track paving made with Atlas Duraplastic* air-entraining portland cement practically scale-free after 5 winters of repeated heavy applications of de-icing salts.

You may never have a street-car paving job; but whether you do or not, you can be sure that concrete paving made with Atlas Duraplastic will be highly scale-resistant under applications of ice-removing salts. Such applications are particularly heavy on car-tracks and switches, for these must be kept constantly open and free from ice and snow. Similar car-track paving made with Atlas Duraplastic in St. Paul, South Bend, Pittsburgh and other cities show equally satisfactory results.

These installations but substantiate the results of the original Universal Atlas test road at Hudson, New York (built 1938), and of the scores of Duraplastic paving installations now in service in more than a dozen states and cities. Many of these are now in their fourth or fifth year of service and all are practically scale-free.

For more information on Atlas Duraplastic, write to our Technical Service Bureau. Ask for reprints of articles from technical journals giving details of actual installations. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

. . .

OFFICES: New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Minneapolis, Duluth, Cleveland, St. Louis, Kansas City, Des Moines, Birmingham, Waco.

CM-D-7

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ATLAS DURAPLASTIC CEMENT

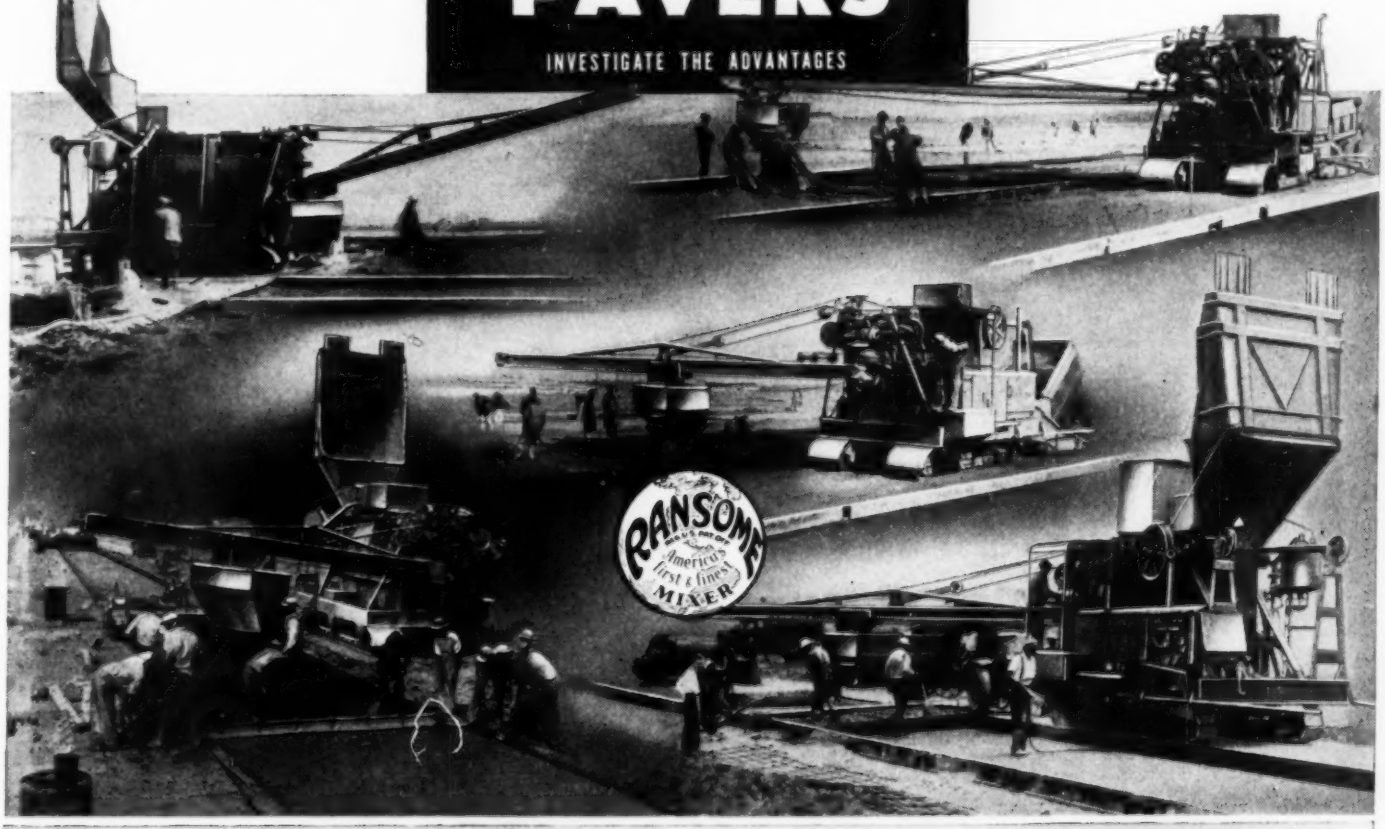
A Universal Atlas Product

Ransome

34E SINGLE AND DUAL DRUM PAVERS ARE THE ONLY HYDRAULICALLY CONTROLLED PAVERS

INVESTIGATE THE ADVANTAGES

The efficient hydraulic operating system on Ransome Pavers means sustained high speed, minimum loss of time and profitable operation . . . you swing and spread simultaneously. At construction joints, hydraulic operation of the bucket doors enables operator to deposit concrete on one side of joint, close doors and then place balance of batch wherever required. . . . . Normal operating cycle is unchanged. No more split batches — you discharge a full batch into bucket every time. In cold weather, hydraulic fluid is freeze-proof. On your next paving job, use a Ransome 34-E Paver.



CONSTRUCTION EQUIPMENT DIVISION **Ransome MACHINERY COMPANY**

DUNELLEN, NEW JERSEY

SUBSIDIARY OF WORTHINGTON PUMP AND MACHINERY CORPORATION

SOUTHWEST *Hauling Scoop*

SINGLE CABLE CONTROL

Here it is—the first rear dump hauling scoop with *single cable control!* No longer is it necessary to have hydraulic equipment to have a rear dump unit. Southwest does it with the single cable control. And here are some of the advantages: Dumps safely over embankments—Works well in difficult places —Dumps while moving forward, backward or standing still—Shortens operational cycles by *controlled* spreading. Sturdy design and construction to handle tough jobs easily. Ideal for road maintenance and repair.

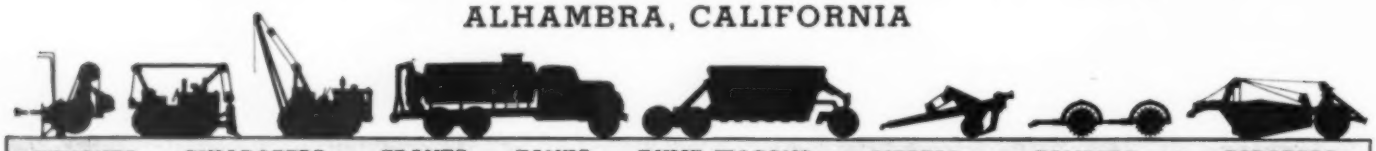
Four page bulletin available on request. Gives engineering data on the three standard sizes of Southwest Hauling Scoops. Write Department A130 Southwest Welding & Manufacturing Company, Alhambra, California.

The Southwest Single Cable Control Scoop can be operated by a single drum or as a "dozer scoop" combination with double drum unit.

CONSTRUCTION MACHINERY DIVISION

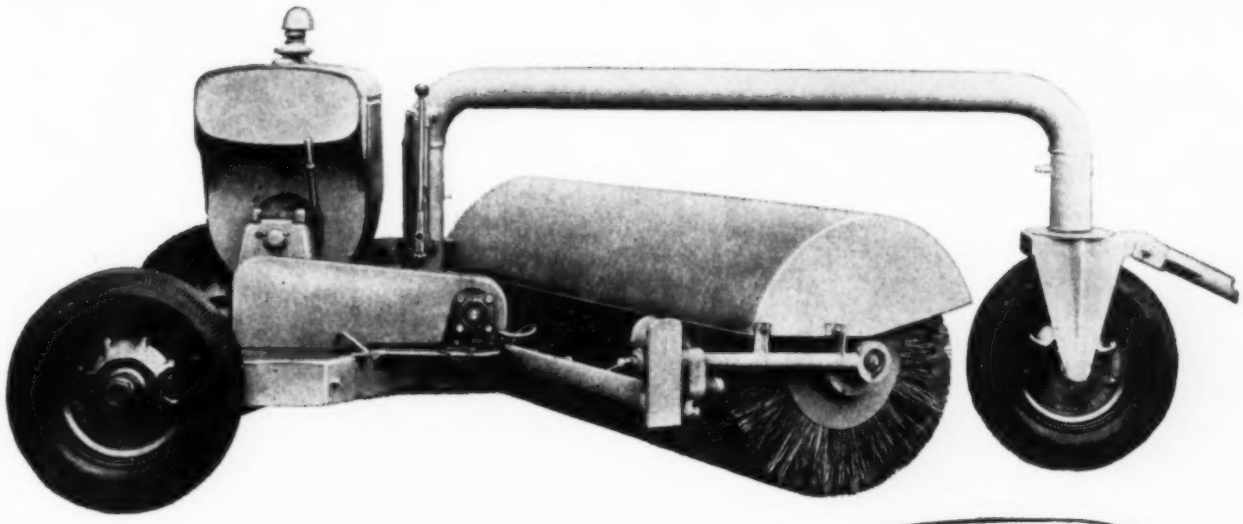
Southwest Welding & Manufacturing Co.

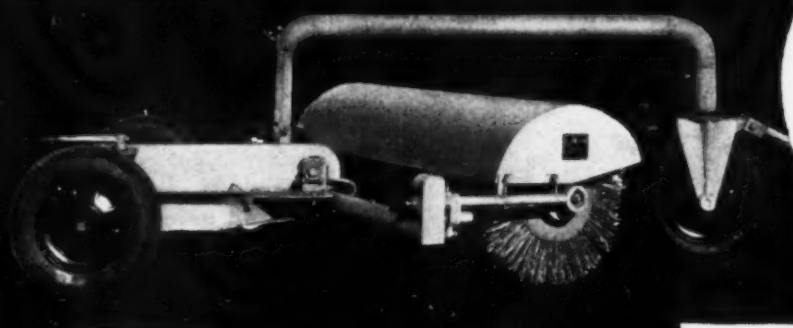
ALHAMBRA, CALIFORNIA



WINCHES BULLDOZERS CRANES TANKS DUMP WAGONS RIPPERS TAMPERS SCRAPERS

LITTLEFORD ROAD BROOMS

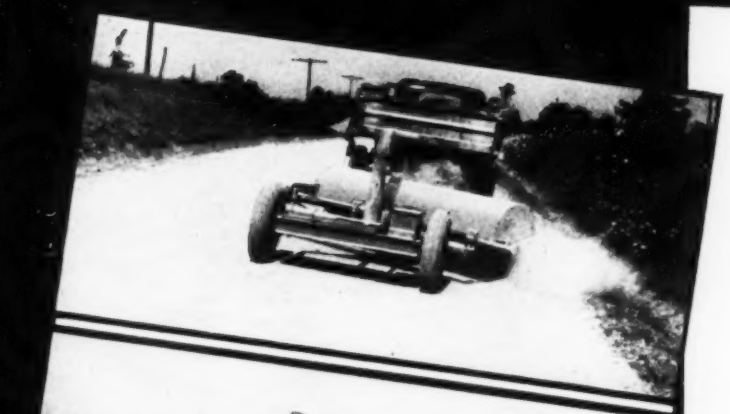




MODEL NO. 108
POWER DRIVEN BROOM

—

MODEL NO. 106
TRACTION DRIVEN BROOM



Above—Traction Driven Broom sweeping away dust to give perfect bond when Bitumen is applied.

Below—Power Driven Broom sweeping away loose dust before Bitumen is applied.

Before applying asphalt or tar to a road, use a Littleford Road Broom to sweep away the dust and dirt. Littleford Power or Traction Driven Brooms can be changed to sweep right or left — they're two way Brooms — can change from one sweeping position to the other in less than two minutes time. A hydraulic lift adjusts the tension of the Brooms on the sweeping surface. These modern Brooms are designed to do their share in building post war roads.

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE · 1900

LB LITTLEFORD

LITTLEFORD BROS., INC.
465 E. Pearl St., Cincinnati 2, Ohio

MARKS of LEADERSHIP

The name LIMA on a shovel, crane or dragline is recognized as a mark of *leadership* by users who keep abreast with the latest in power excavator design and performance. LIMA has always been a *leader* in the designing and perfecting of new and practical features to help increase production and to lower operating cost on earth moving projects. This continuous search for new and better methods of doing things has been responsible for many outstanding advancements in excavator design. When you buy your next shovel, crane or dragline be sure it is a LIMA and get these modern distinctive features:

1. Anti-friction bearings at every vital bearing point for greater power and efficiency.
2. Independent clutches—hoist, swing, travel, boom up or down simultaneously.
3. Big wide drums for maximum cable economy. All shafts on which are mounted sliding members are splined for accuracy in fit and elimination of backlash.
4. These advantages plus the extra power and ruggedness of LIMA shovels, cranes and draglines are qualities you must have for greater output day in and day out.

Keep Buying WAR BONDS

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division

LIMA, OHIO, U. S. A.

NEW YORK, N. Y. PHILADELPHIA, PA. MEMPHIS, TENN. ST. LOUIS, MO. NEWARK, N. J. PORTLAND, ORE.
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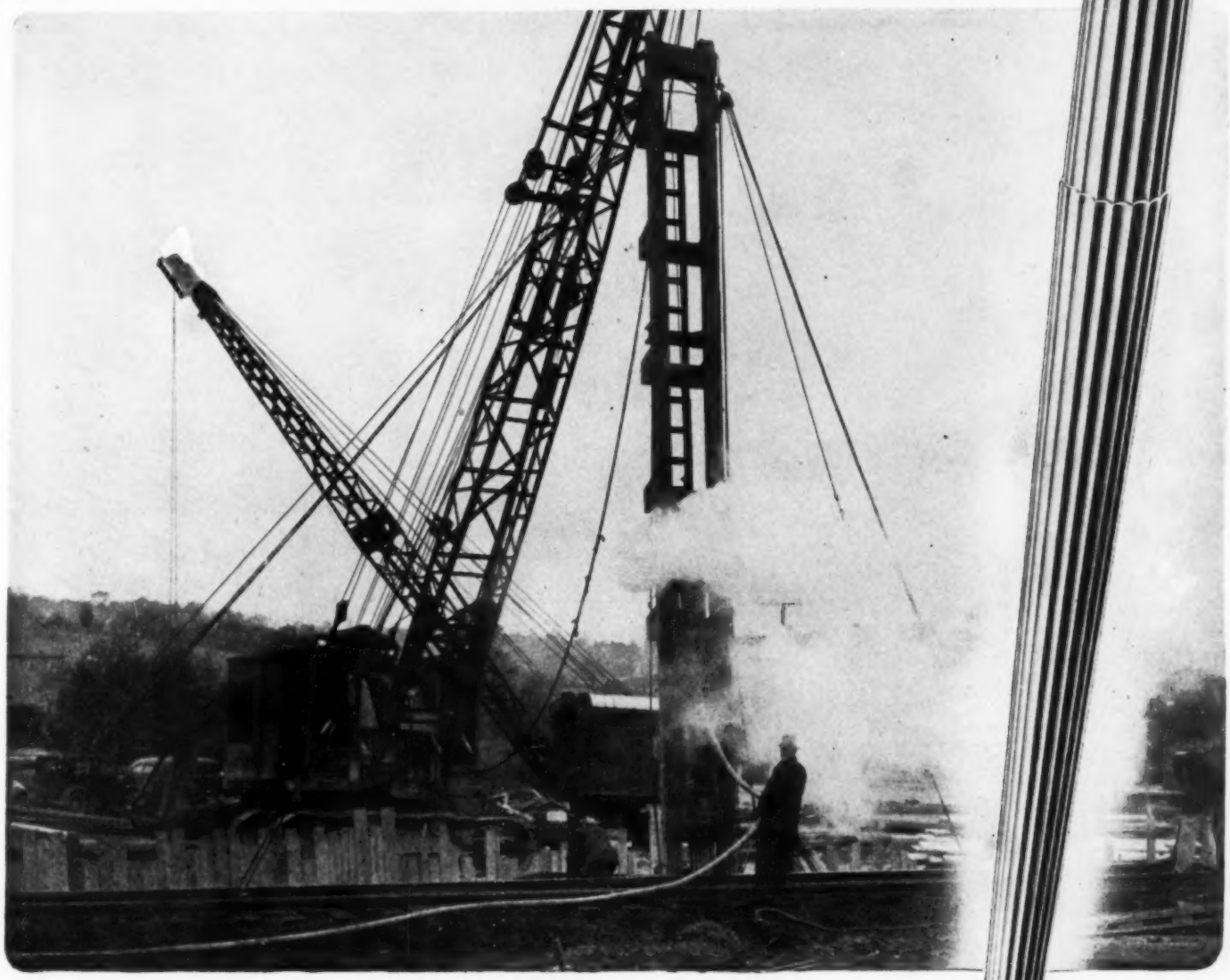
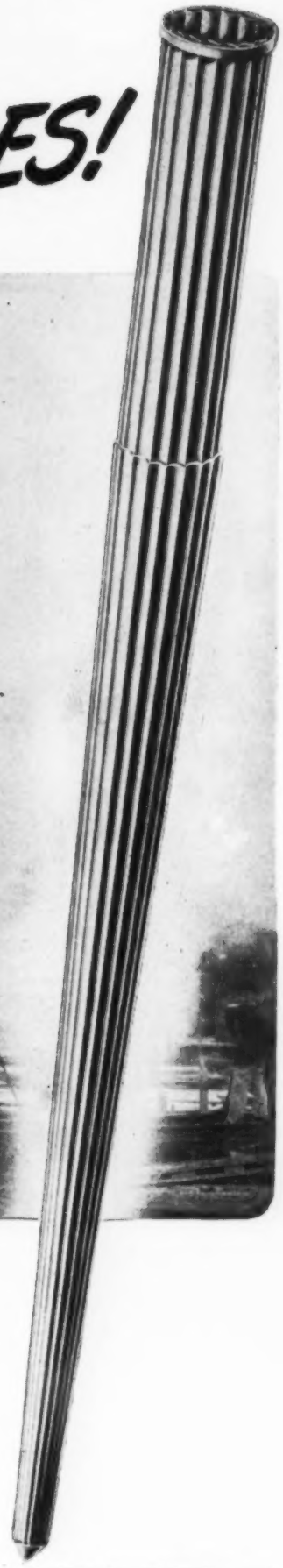
SHOVELS, ¾ YD. TO 3½ YD. CRANES, 13 TONS TO 65 TONS
DRAGLINES, VARIABLE

You can do it Better ...with MONOTUBES!

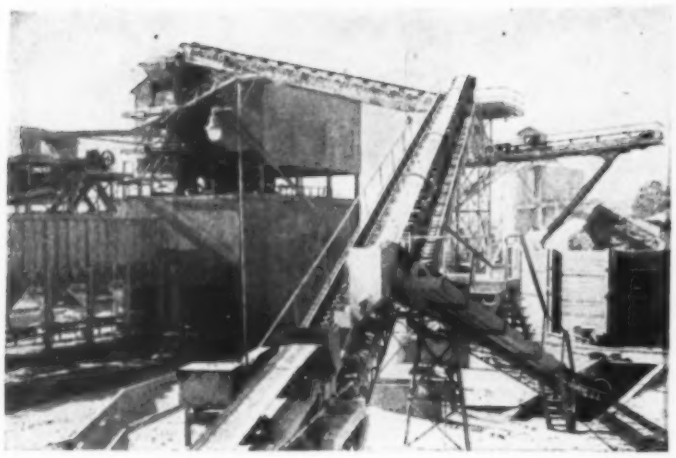


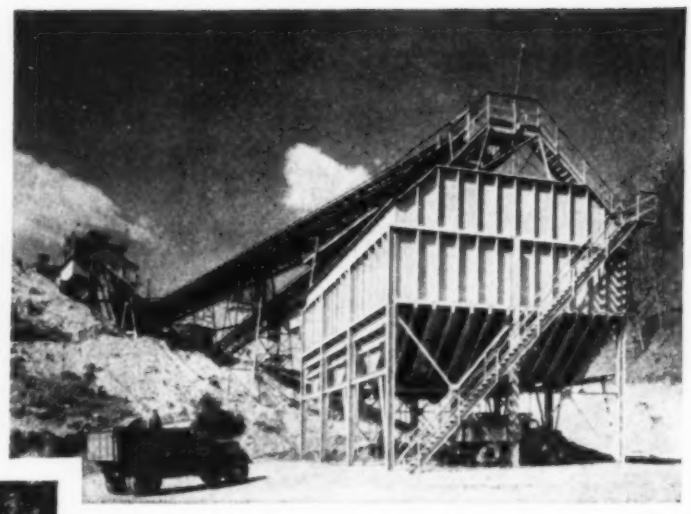


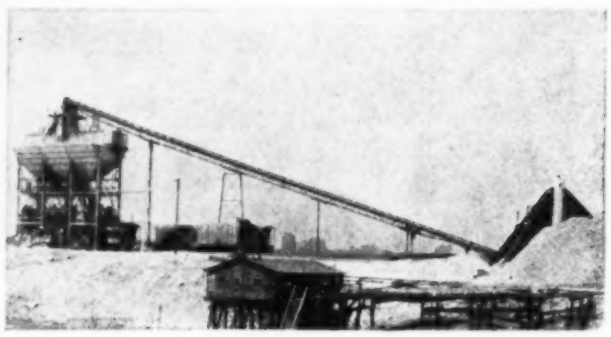
And here's why: Their tapered, fluted construction makes possible *speed with safety;* their tubular design means that you can *inspect them quickly,* top to toe, after they're driven to required bearing; extensions permit the fast, economical *installation of varying pile lengths* even in low headroom; and their light weight, despite their remarkable strength, allows you to *drive them with average job equipment.* Gauges, sizes, and tapers to meet all requirements. Write for your copy of Catalog 68A to the Union Metal Manufacturing Co., Canton 5, Ohio.

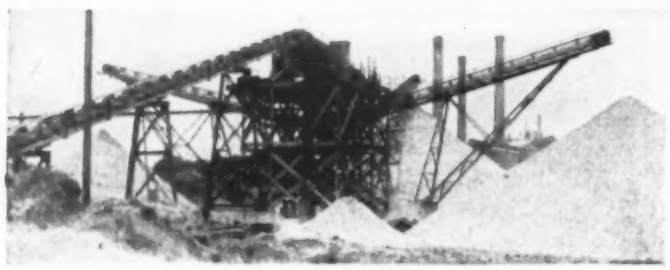
UNION METAL

Monotube Tapered Piles

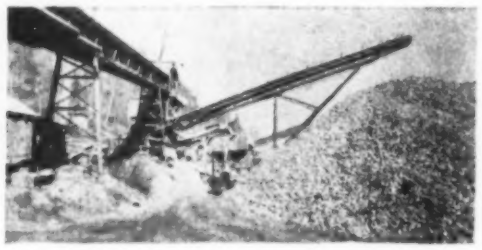








CUSTOM BUILT



With Standard Units....

Typical of the Barber-Greene concept of Standardized Sectional Conveyor construction are the installations shown here. The belt conveyors used in these plants consist, for the most part, of standard units, pre-engineered and designed for production manufacture. These standard terminals, trusses, carriers, A-frame supports, and take-ups are available in a wide range of sizes and horsepower to meet a custom engineered application.

The Barber-Greene Engineering Department will assist you in utilizing this equipment to best advantage. It is equipment that can be expanded as your plant grows merely by adding standard units. Barber-Greene Co., Aurora, Ill., U. S. A. 44-26

BARBER GREENE

ARMY E NAVY

AURORA, ILL., U. S. A.

450,000 MILES

OF WARTIME SERVICE!

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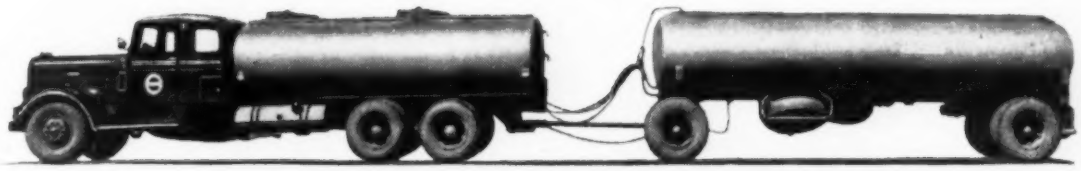
Extraordinary Highway Transport Service
H. F. JOHNSON, BILLINGS, MONTANA
AN OUTSTANDING ALL-ROUND EQUIPMENT
THE TIMKEN-DETROIT AXLE COMPANY
H. F. JOHNSON
Petroleum Products Transportation
Billings, Montana
August 7, 1944
Timken-Detroit Axle Co.
Detroit, Michigan
Gentlemen:
Our Kenworth Model 523-Yw truck, equipped with Timken SW-3000
worm drive dual rear axles, 6 to 1 ratio, has traveled over
450,000 miles since February, 1941, and is still "going strong."
This truck pulls a full trailer with a total load of 6900 gallons
of gasoline and light fuel oils, making the gross train weight
from 66,000 to 68,000 pounds. It operates between Shelby, Sunburst,
and Billings, Montana, to points such as Miles City, Great Falls,
Helena, Missoula, Bozeman, and West Yellowstone, Montana, and to
Sandpoint, Salmon, Coeur d'Alene, Pocatello, Idaho Falls, Twin Falls,
and Boise, Idaho.
Grades run up to 6%, with elevations of almost 7000 ft.--some ft.
on Monida Pass and 6448 ft. on Gibson Pass. This truck averages
about 15,000 miles per month, and its average speed is approximately
30 miles per hour.
We inspected the axles after 14 months of service, and found them
in first-class shape. We reversed the worm gears then, although
they showed very little wear, and the wear was about the same on
both the drive and coast sides. This was probably due to the fact
that the engine is used to brake the load on the down grades for
half its total mileage.
We also replaced the wheel bearings on the forward rear axle, as
they were pitted due to operating in water. Bearings on the other
axle were not affected, probably due to some slight difference in
adjustment. We have not had to replace any axle shafts and very
few other axle parts.
The original set of tires ran 35,000 miles and the second set
70,000. Our records are not complete on the next few sets, but
we are now averaging about 25,000 miles on the present war time
tires. All rear tires are matched for rolling radius and the
pressure is checked and equalized before each trip.
We thought you would be interested in the remarkable record of
this truck, all made in the last 28 months.
Yours very truly,
H. F. JOHNSON
By H. F. Johnson

Mileage equal to 18 trips around the equator in less than two and a half years is the amazing record of this H. F. Johnson truck, operating over mountain roads in Montana and Idaho. Only a sturdy truck, skilfully driven and expertly maintained, could compile such a phenomenal record.

A Timken SW-3000 worm drive dual rear axle unit, original equipment on this truck, has contributed its full share to this wartime highway transport record.

Timken is proud to present the above Citation for Extraordinary Highway Transport Service to Mr. Johnson. Similar citations are being awarded to other operators, for outstanding performance and maintenance records, as the facts come to our attention.



38 YEARS OF AXLE ENGINEERING LEADERSHIP

TIMKEN AXLES — The Accepted Standard — D A CO

TIMKEN AXLES

THE TIMKEN-DETROIT AXLE COMPANY, DETROIT 32, MICHIGAN

WISCONSIN AXLE DIVISION • OSHKOSH, WISCONSIN

TALK ABOUT CONVERSION—

Read These Facts!

Before—

Beu & Sons, Sumner, Iowa, "190-G" Universal crushing, screening and loading plant with 10"x36" jaw crusher, is shown producing aggregates near Pine Lake State Park, Hardin County, Iowa. Output averaged 1,500 yards per 10½ hour day from an unusually deep pit and ran as high as 2,200 yards in a 12½ hour day.

This progressive contractor recently took a contract for agricultural limestone in northern Iowa.

After—

The jaw crusher on the "190-G" was readily replaced by a Universal No. 4 hammermill and a Universal primary unit consisting of a 20" x 36" roller bearing jaw crusher with apron feeder was added providing a "tailor made" plant capable of handling the new contract. The revamped plant is shown operating near Ackley, Iowa. As much as 125 tons of aglime per hour have been turned out, averaging better than 100 tons per hour.

This is another case where standard Universal units were economically used to readily convert a plant. There is no end to the variety of combinations that are possible using standard Universal "packaged units."

Handle aggregates today, riprap tomorrow, ballast next month.

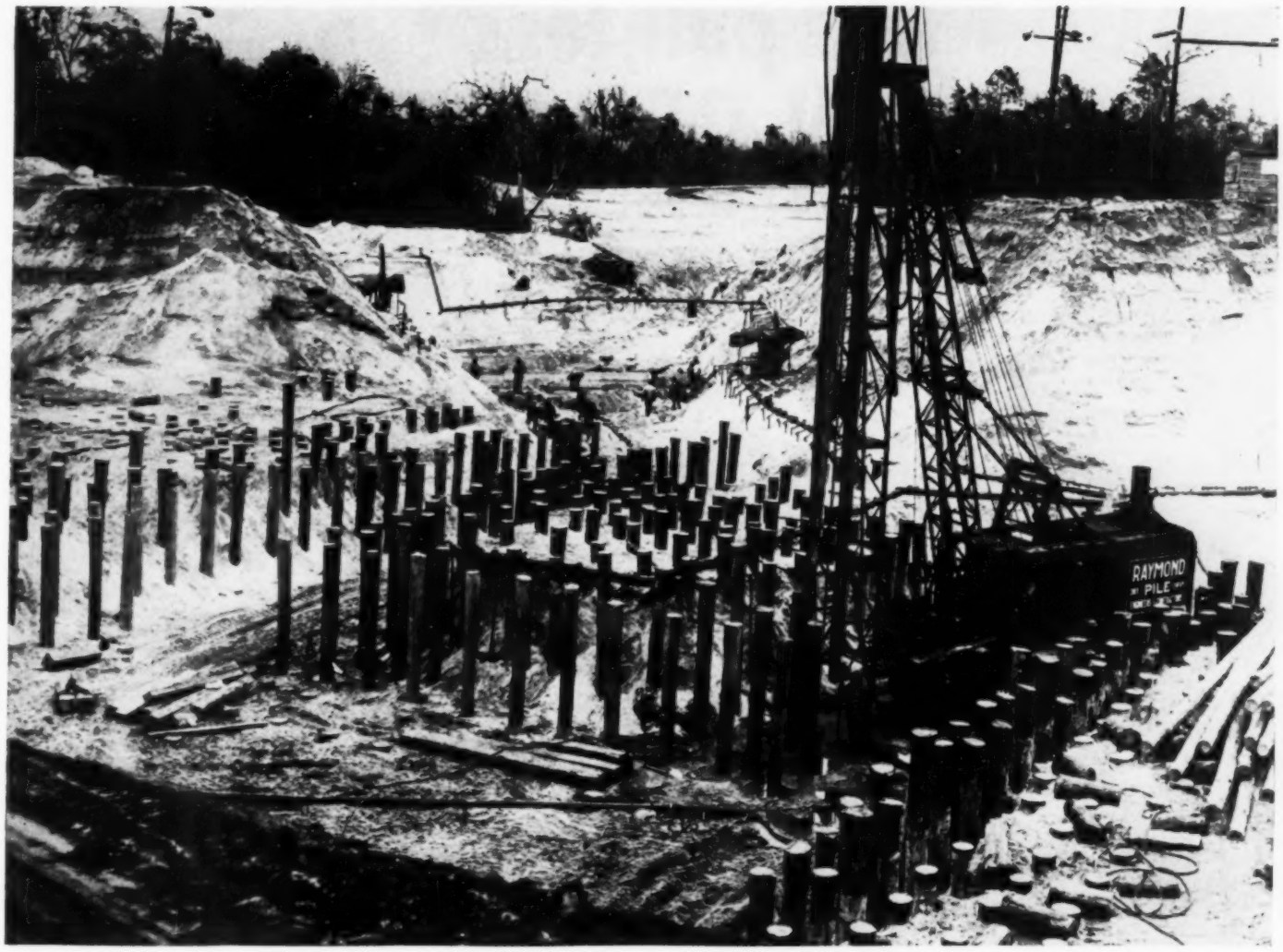
Universal engineers and field men have the answers to your conversion problems.

UNIVERSAL ENGINEERING CORP.
327 8th Street, West Cedar Rapids, Iowa

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

Start Post-War Planning Now!



IT'S ALL IN THE CONTRACT

"MORETRENCH agrees to furnish all necessary wellpoint equipment, materials, labor and supervision to furnish, install, operate, maintain and remove all the necessary pumping equipment required to predrain for a period of three months, the excavation area for the foundation of our steam plant."

(Excerpt from our contract with a power company.)

We quote this to remind you that MORETRENCH can make such contracts with confidence because of:

★ Experienced engineers who investigate proposed work, plan pumping procedures, estimate costs accurately.

★ The perfection of Moretrench Wellpoint Equipment.

★ The efficiency of Moretrench Demonstrators, gained from actual experience on every type of construction project.

IF YOU WANT STEADY PROGRESS ON A WET JOB . . . GET MORETRENCH!

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More pull, less slip with O-P-E-N C-E-N-T-E-R traction

Le Tourneau Super Tournapull and Carryall Scraper on Goodyear Sure-Grips

THE bigger your prime movers, the greater yardage you're handling, the more need you have for tires that won't cake up and spin.

That's why more and more contractors are specifying Goodyear Sure-Grips. This great tire's time-proved O-P-E-N C-E-N-T-E-R *self-cleaning* tread has no dead-end pockets, no mud traps to fill up.

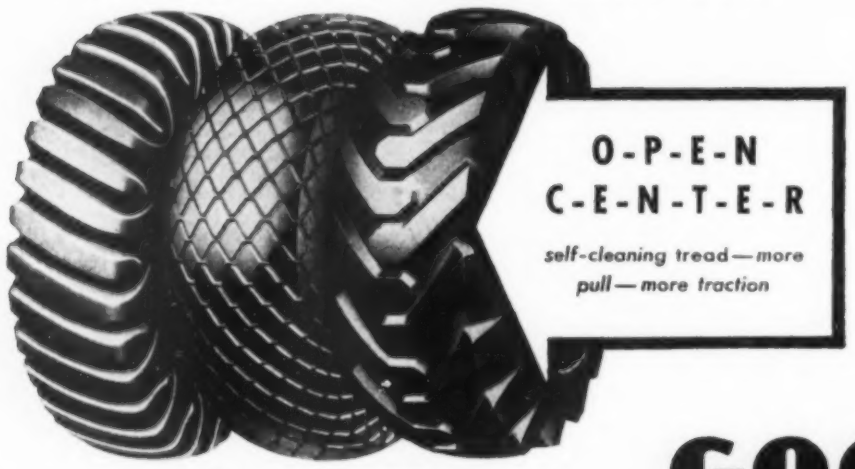
Its big, wide, unblocked channels sluice out dirt and stones, leaving those big, massive lug bars clean and free to bite deep and pull in any going.

As a result you get more draw-bar pull, more speed, more round trips per shift, more yardage moved per unit—*more work at less cost!*

Add the greater toughness of Goodyear's exclusive multiple-compounded construction, plus the extra strength of Goodyear's Supertwist cord carcass, and you get the longest-lasting, hardest working tire ever built.

Just ask the men who are using them. Once you've heard their story, you'll want Goodyears on all your units.

THE RIGHT TIRE FOR EVERY JOB



HARD ROCK LUG for all rock work

ALL-WEATHER EARTH-MOVER for drawn vehicles

SURE-GRIP for mud and marsh

Sure-Grip, Supertwist, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

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GOODYEAR

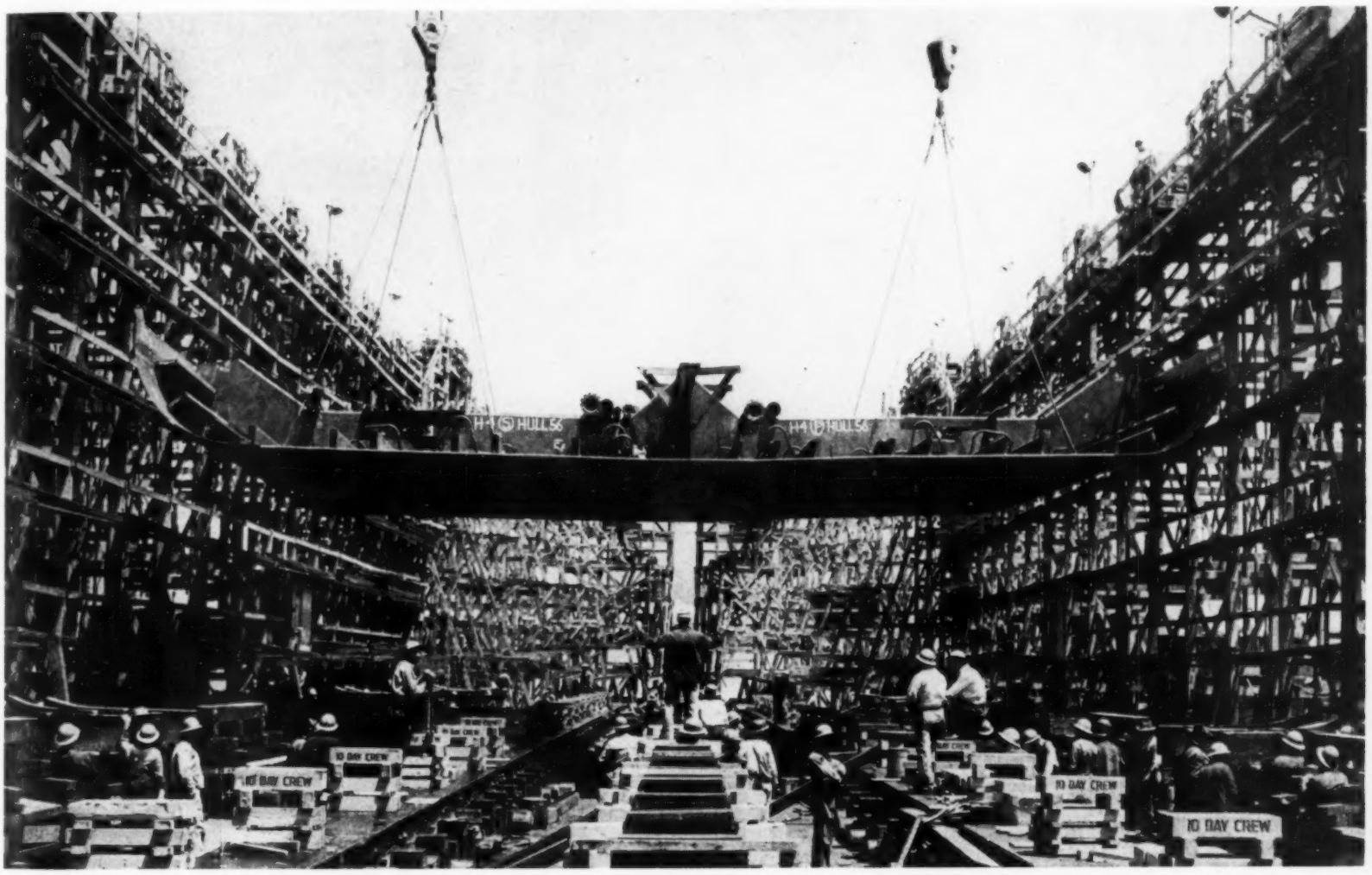
THE GREATEST NAME IN RUBBER

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Construction Methods

ROBERT K. TOMLIN, Editor

Volume 26 — SEPTEMBER, 1944 — Number 9



FLAT BOTTOM AND BILGE SECTION, weighing 76 tons, is lowered as unit on to keel blocks for 16,500-ton tanker at Marinship Yards. Assembly includes all necessary piping. Prefabrication, with aid of welding, plays important part in building these steel hulls.

76-Ton Ship Section Prefabricated and Lowered as Unit On to Keel Blocks

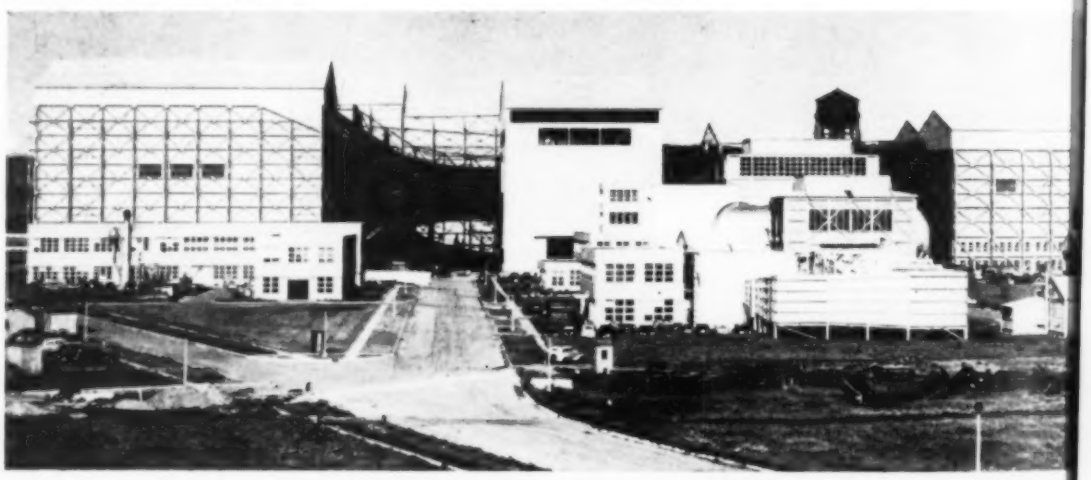
METHODS OF CONSTRUCTING VESSELS for the U. S. Maritime Commission are subject to frequent and radical changes as the managements of West coast yards devise new shortcuts to speed production. In the accompanying photograph, a 76-ton flat bottom and bilge section, with all heating coils and cargo piping installed, is lowered on to the keel blocks at Marinship yards in Sausolito, Calif., as work is started on a 16,500-ton tanker. The entire assembly was fabricated by shipyard crews prior to placing.

The prefabricating operations were divided into five distinct phases: (1) Construction of flat keel; (2) assembling of vertical and flat keel sections; (3) fabricating and setting in place of flat bottom; (4) adding of bilges and (5) installing of piping and heating coils. Installation in ship sections of piping and heating coil is one of the latest operational techniques developed in Pacific coast shipyards as a means of stepping up production.

THIS MONTH'S NEWS REEL

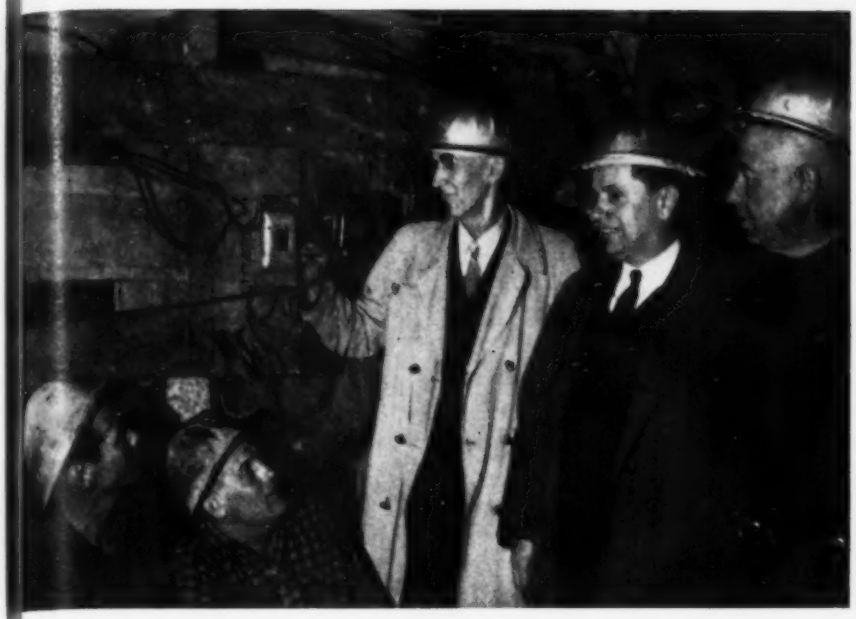
"WEASEL," new type personnel and cargo carrier for arctic reconnaissance or commando raids, is capable of operation over great variety of terrain conditions. In secret production by Studebaker Corp. for two years, it has just been announced by Army Ordnance Department. Propelled by special rubber track designed by B. F. Goodrich Co., it exerts ground pressure only about one-fourth that of fully equipped infantryman.

GIANT WIND TUNNEL (below) for full-scale airplane testing is completed at Ames Aeronautical Laboratory at Moffett Field, Calif., by Pittsburgh-Des Moines Steel Co. Built at cost of $7,000,000, it is 868 ft. long and 180 ft. high. It is 399 ft. wide at one end and 353 ft. at other. It is steel framed with cement-asbestos covering. Six 6,000-hp. Westinghouse motors, weighing 57 tons each, drive 40-ft., 6-bladed spruce fans to produce wind velocities of more than 260 mph. Covering 8 acres, it is large enough to test planes up to 72-ft. wingspread.

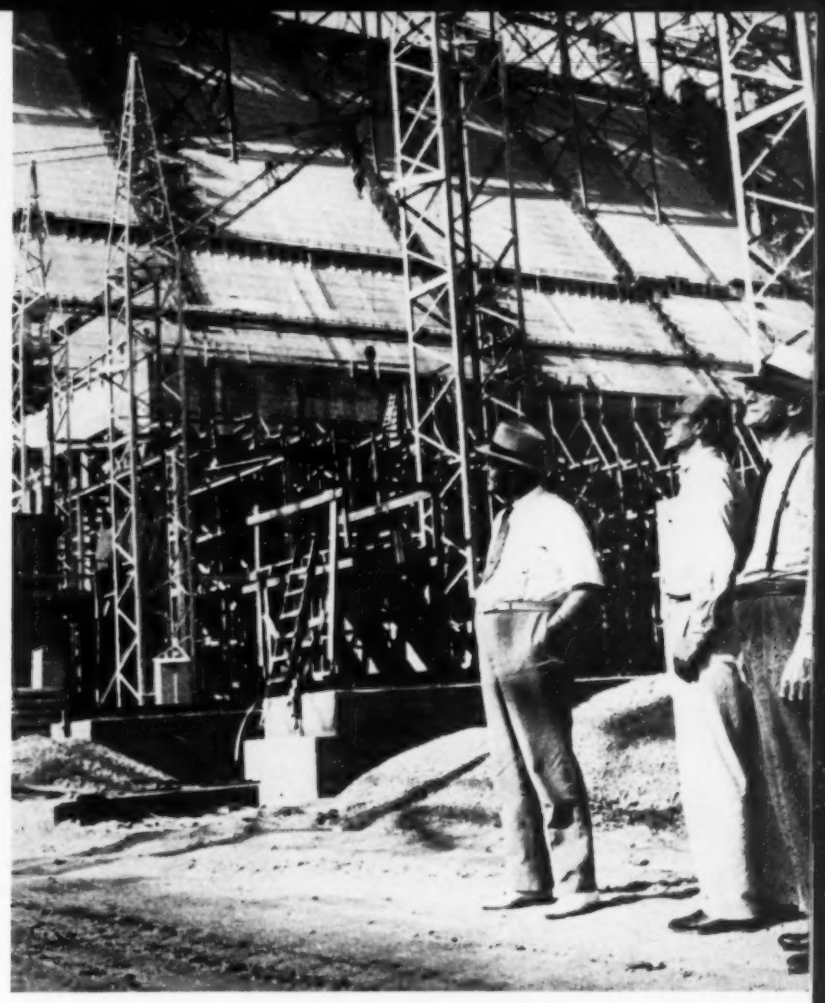


LAST LIBERTY SHIP (below) is launched at Richmond, Calif., shipyard of Permanente Metals Corp., as replica of Statue of Liberty is unveiled. Signal for unveiling was given to truck crane operator by Mrs. Henry J. Kaiser. Total of 519 Liberty ships were built by Richmond yards. Fore 'n' Aft Photo

TOUGH HAULAGE MISSION is carried out by this International tractor and Athey trailer (below), operated by U. S. Marines to deliver food and ammunition to front lines at Bougainville, in South Pacific war theater. Jeeps and trucks, it is reported, were unable to get through knee-deep sandy mud formed by daily rain storms. U. S. Marine Corps Photo



HOLING THROUGH of 13.1-mi. Alva B. Adams Tunnel on Colorado-Big Thompson project in northern Colorado is accomplished, as S. O. HARPER, chief engineer, U. S. Bureau of Reclamation, pulls switch to fire last round of shots. With Mr. Harper are OSCAR L. CHAPIN, Assistant Secretary of the Interior (center) and C. H. HOWELL, project engineer, Bureau of Reclamation. When lined with concrete, this 10-ft. dia. tunnel, longest ever driven from two headings, will divert 320,000 acre-ft. of water annually from Colorado River to Big Thompson. It was bored by S. S. Magoffin Co., of Englewood, Colo., and Stiers Bros., of St. Louis, Mo.



FINAL OFFICIAL INSPECTION of Fontana Dam in North Carolina is made by board of directors of Tennessee Valley Authority. Scheduled for closure within few months, this dam on Little Tennessee River will be 460 ft. high and will store 4,570,000 acre-ft. of water. TVA board members are (left to right): JAMES P. POPE, DAVID E. LILIENTHAL, chairman, and DR. HARCOURT A. MORGAN.

ARMY ENGINEER UNITS (below) of all types march in review at Army Service Forces Training Center, Camp Claiborne, La., largest installation of its kind in United States. Cars bearing inspecting officers move past 20 battalions of more than 20,000 men. Standing in front line (left) at Center's Huckabee Field are (left to right) MAJOR GENERAL HARRIS MELASKY, commanding general, 86th Infantry Division; COL. HOLLAND L. ROBB, commanding officer, ASFTC, and COL. LANDON J. LOCKETT, commanding officer of Camp Claiborne, with ASFTC staff members in rear.

ARMY ENGINEERS PLAY VITAL ROLE IN *Invasion of France*

Major General Cecil R. Moore, Chief Engineer, European Theater of Operations, tells of manifold activities in establishing and extending Normandy Beachhead.

TO U. S. ARMY ENGINEER UNITS a wide range of difficult and hazardous duties was assigned when D-Day, June 6, marked the establishment by the Allied Armies of a beachhead on the Normandy coast of France, and the beginning of an advance along the Cherbourg peninsula against Nazi forces. Among the manifold tasks performed by the Engineers, under enemy fire, were the building of airfields surfaced with steel wire mesh, repair of bombed highways and railways, detection and removal of enemy mines, rehabilitation of damaged docks and port facilities at Cherbourg, construction of bridges, clearing streets of debris resulting from destruction of buildings by bombing and artillery fire, putting enemy-sabotaged power plants, waterworks systems and other utilities back into service.

On July 9, after the success of the invasion was assured, Major General Cecil R. Moore, Chief Engineer, European Theater of Operations, speaking over the radio from England, told of the part that the Army's Engineers had played in establishing a base of operations in France and in consolidating the subsequent gains made as the Allied forces advanced inland. A transcript of the broadcast, comprising General Moore's answers to questions by his radio interrogator, Lt. Col. Brooks Watson, follows:

Gen. Moore Describes Engineers' Mission

Col. Watson: "This is England. The biggest Army engineering project at the present moment is the reconstruction of Normandy's great port. As such, it is the principal concern of Major General Cecil R. Moore, Chief Engineer, European Theater of Operations. General Moore joined the Ninth Infantry Division in their drive up the peninsula so that he could make an early inspection of the damage to Cherbourg. I understand, General, that when the German Port Commander, von Schlieben, was first captured, you were the only American present who could speak German."

MAJOR GENERAL CECIL R. MOORE, who tells of mission of Engineers during invasion of France in broadcast, reproduced herewith, is Chief Engineer, European Theater of Operations.
U. S. Army Pictorial Service

General Moore: "There wasn't much talk necessary. Even though von Schlieben couldn't speak English, he had only one intention — to surrender. And General Matt Eddy, Commander of the Ninth Division, was quite willing to accommodate him. Von Schlieben was a typical, hard-boiled old soldier, but he seemed dazed by the sudden loss of his command."

Col. Watson: "General Moore, now that Cherbourg has been taken, I suppose our supply problems will be solved?"

General Moore: "I wish it were that simple. Cherbourg was famous as a passenger port, but never as a great port. Naples, for example, handled 16 times as much tonnage as Cherbourg before the war. As a matter of fact, our Engineer Special Brigades are able to move over the open beaches many times the tonnage Cherbourg normally handles."

Col. Watson: "Then you mean that Cherbourg is not important to us?"

General Moore: "No, by no means. The possession of the port will be a tremendous advantage. Cherbourg, when rehabilitated and its

PROTECTED BY ARMOR PLATE, this tractor-bulldozer (right) starts cleaning up debris from battle-scarred walls of buildings in town on French coast from which Germans had been driven by Allied invasion forces.

cargo facilities developed, will give us a sheltered anchorage for deep sea vessels, as well as docks where they can be unloaded directly."

Col. Watson: "What about the damage done by the Germans?"

General Moore: "When I first inspected the harbor area, I found that although the Germans did not destroy everything in the port, they did demolish all facilities most difficult to replace. The docks that accommodate large ships were almost completely destroyed.

"The railroad equipment showed the same well-planned destruction. The Germans had destroyed the longest bridges, the most complicated equipment, and used demolition charges to cave in a long tunnel.

"Fortunately, the American advance was so rapid that they were not able to carry out all of the demolitions. We had been working about two years on plans for rebuilding the port, and the damage done was about what we had estimated. When I first went into the Cherbourg power plant, I found the French operator moving out the explosives that the Germans had placed but didn't have time to set off."

Col. Watson: "How are the repairs getting along, General?"

General Moore: "I have just returned, and I'm glad to report that the power plant is in operation and our Engineer troops have repaired the water system so that both power and drinking water are now available. Mines and booby traps are being cleared out. Our Engineer Port Reconstruction Group is at work. The job is going ahead. Near the front, I saw two railroad bridges on the Paris-Cherbourg line being repaired by our Engineer troops while they were still under enemy fire."

Col. Watson: "From what you have said, there must be plenty of work to be done at Cherbourg."

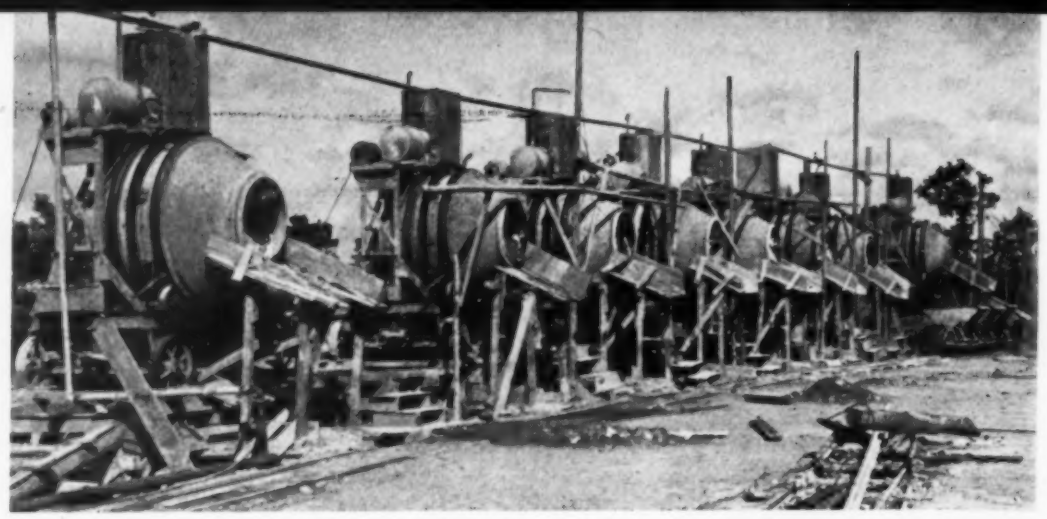
General Moore: "That is true. The Navy's job is to clear sea mines and sunken ships; our Engineer job is to clear debris, remove land mines, rehabilitate utilities and railroads, rebuild docks and repair the roads. The Transportation Corps handles cargo, schedules the movement of men and materials through the port and operates the railroads. It is a real job of teamwork between the Navy, the Transportation Corps, and the Engineers."

Photos, Signal Corps, U. S. Army

PONTON EQUIPMENT (below) is placed in service by Engineers to enable army motor vehicles to cross French stream en route from invaded coast to Bricquebec. Roadway is carried by rubber floats inflated with air under low pressure.

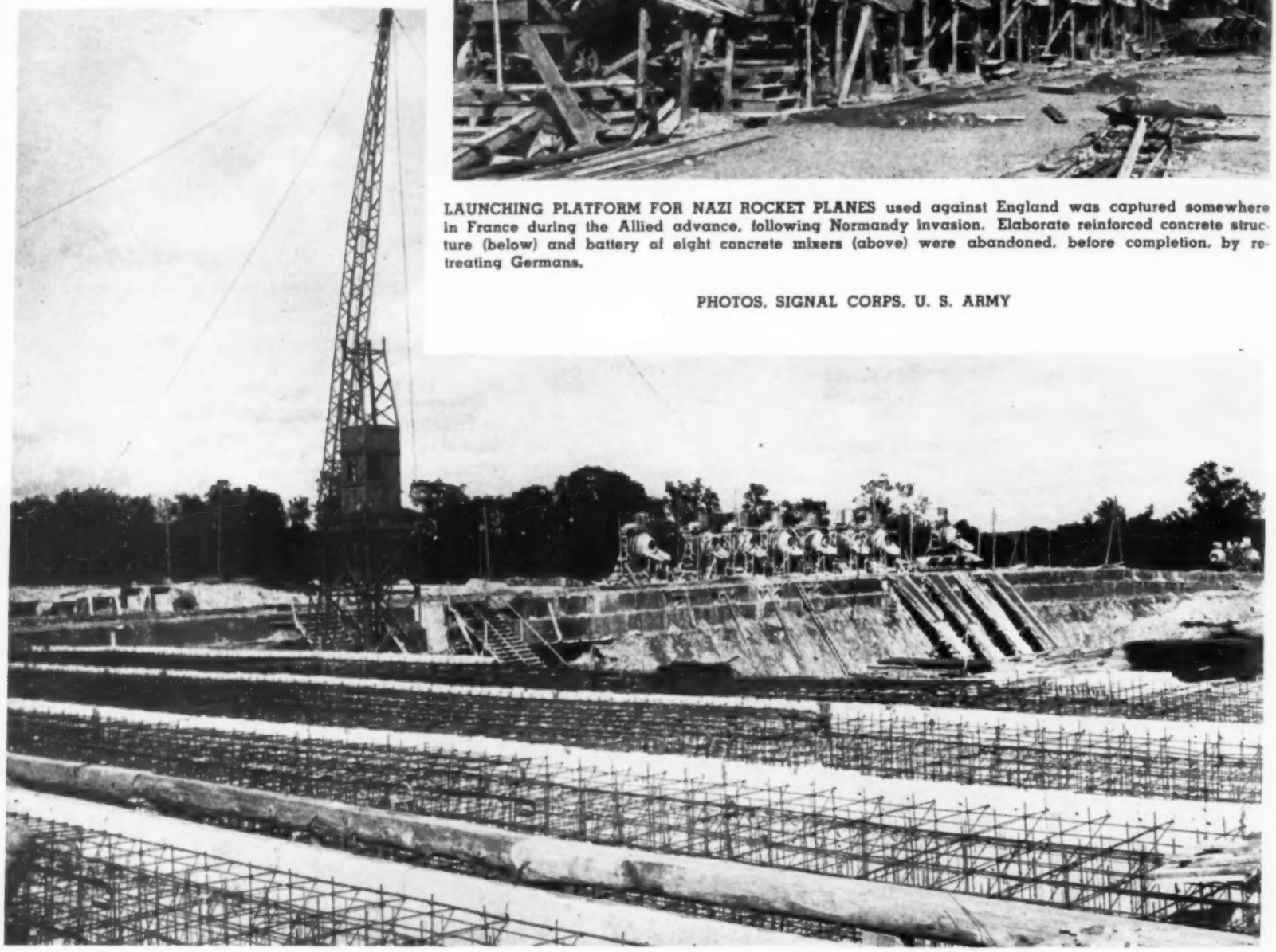
Invasion of France

Continued



LAUNCHING PLATFORM FOR NAZI ROCKET PLANES used against England was captured somewhere in France during the Allied advance, following Normandy invasion. Elaborate reinforced concrete structure (below) and battery of eight concrete mixers (above) were abandoned, before completion, by retreating Germans.

PHOTOS, SIGNAL CORPS, U. S. ARMY



REPAIRS TO BRIDGE ABUTMENT (left) at highway crossing in France, damaged by Germans before retreat, are made by members of an American Engineer unit.

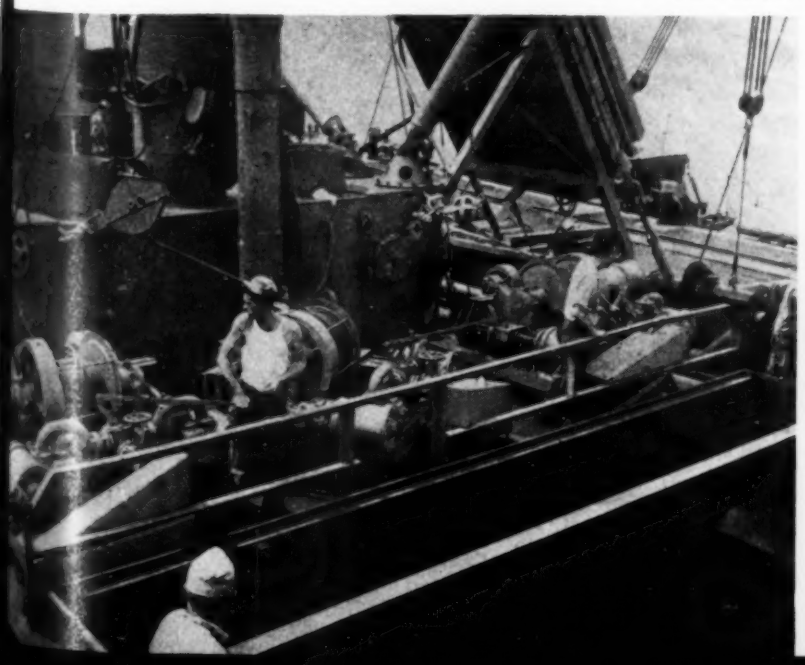
ROAD CONSTRUCTION AND REPAIR (below) a few miles behind the fighting lines in France was one of the first important tasks performed by U. S. Army Engineers.

AIRFIELD STRIPS (right), surfaced with steel wire mesh delivered in rolls, were quickly installed in Normandy area to aid air support for Allied ground forces. After steel mesh is unrolled (above) bulges are flattened with air hammer and crimped with hand tool (below).

UNDERWATER OBSTACLES (below), planted along French shore by Nazi forces to wreck Allied landing craft on Normandy beaches during invasion, are removed and piled on sand by Combat Engineers. Obstacles are irregular units of riveted structural steel members.

DESIGNED FOR HARBOR REPAIR (below) at Cherbourg and other French ports captured from German forces, ships of this type are equipped with all sorts of hoisting equipment, pumps, air compressors and machine shop.

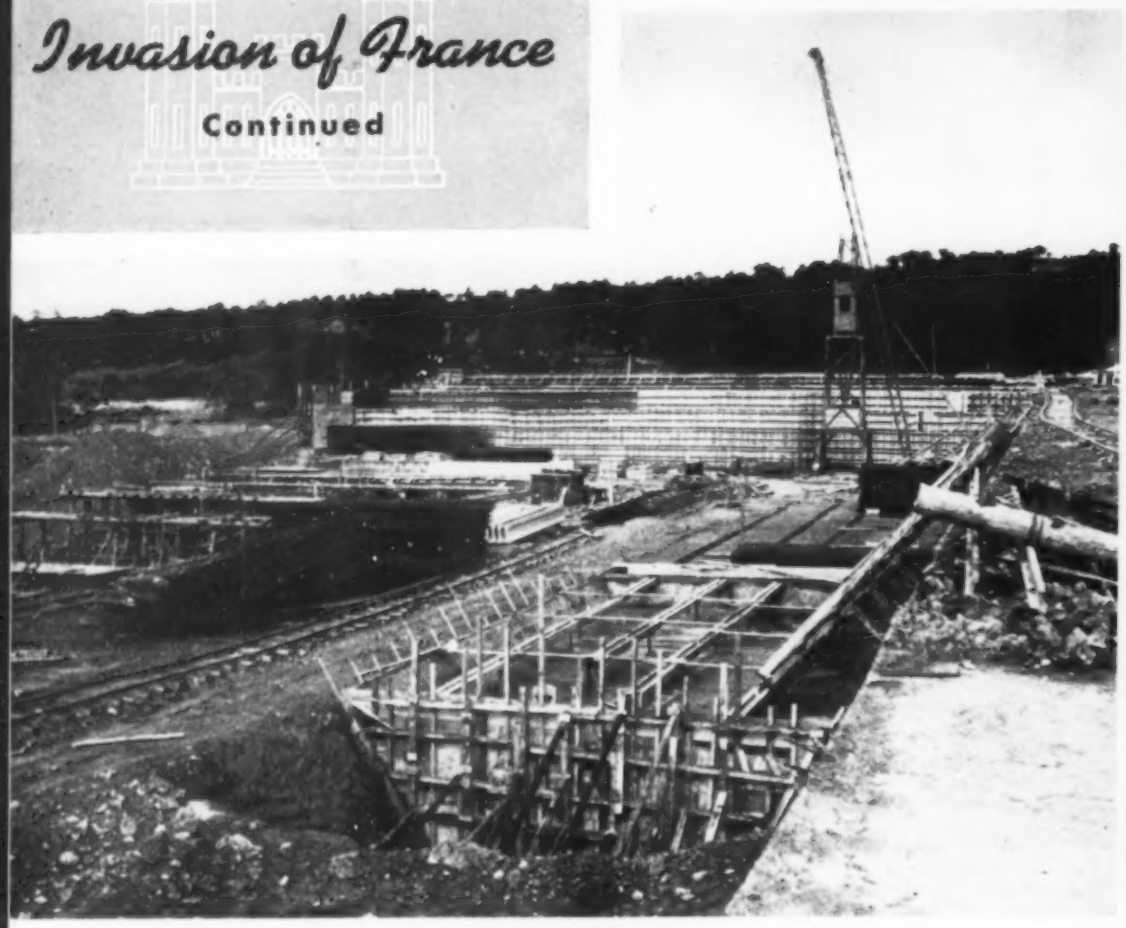
U. S. Army Photo



UNEXPLODED GERMAN MAGNETIC MINE (below), found under ruins of Cherbourg docks, is hauled away by tractor-bulldozer. American Engineers perform this hazardous job.

Invasion of France

Continued

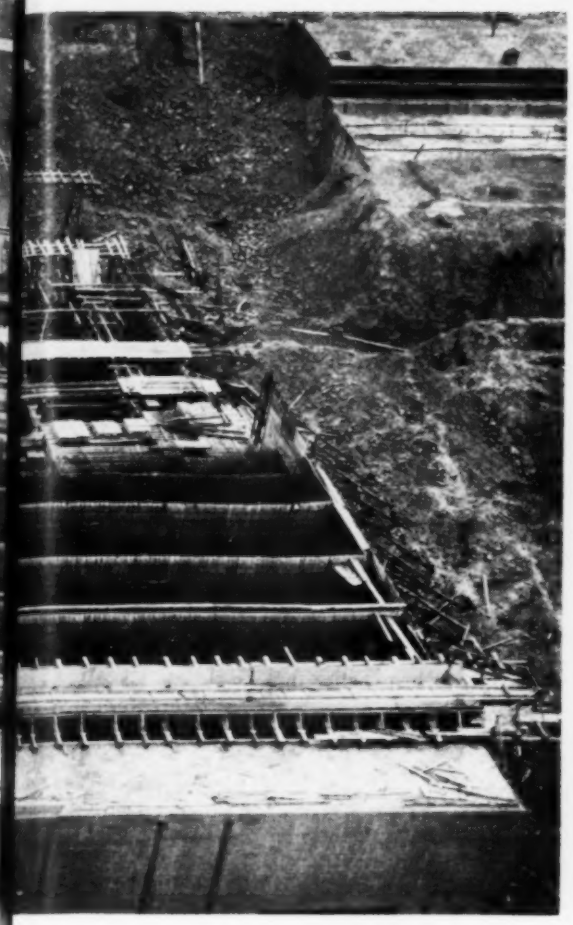


PROBABLE LAUNCHING SITE for German rocket planes is this partially completed reinforced concrete structure captured by Allies 1 mile southeast of Cherbourg. In view at right, note steel reinforcement in place ready for pour of concrete which was never made.

OVER WIRE MESH SURFACING (below) of newly built airfield strip in France crawler type tractor hauls battle-damaged P-47 fighter plane to repair shops.

ACROSS CANAL AT CAEN, in Normandy, Bailey bridge, steel structure of British design (below), is built to aid break-through of General Montgomery's tanks into open country beyond. British Combine Photo

ROLLS OF WIRE MESH for surfacing new airfield in France are delivered from supply dump by truck equipped with hoist and A-frame boom on rear end.



PHOTOS SIGNAL CORPS, U. S. ARMY

ENEMY MINES are detected with special equipment and removed from German-marked mine field in France.

GERMAN ROCK CRUSHING PLANT in French quarry is captured by American invasion troops and placed in operation by Engineer unit.

THICK CONCRETE WALLS AND ROOF (below), heavily reinforced, characterize this captured German fortress housing large-caliber coastal gun near Quineville, France.

GERMAN PILLBOX (below), shattered by American air and artillery bombardment, was concrete structure with steel reinforcement located at Valognes, France.

REPAIR OF STREETS (below) in Cherbourg, shattered by bombing and gun fire, is done by Engineers using truck-mounted air compressor and pneumatic hand tools.

Press Association Photo

LINOLEUM FLOOR COVERING is laid in factory on prefabricated 8x24-ft. panel constructed in accordance with stressed-skin principle by gluing and nailing plywood sheets ½ in. thick to framing members for greater structural strength. In background, trolley chain hoists pick up partially fabricated panel to facilitate turning on jig table in Memphis, Tenn., plant.

VERTICAL JIG supports wall panel in which blanket of insulating wool is being stapled to back side of interior plywood sheets, ¼ in. thick. Manufacturing specifications call for mineral, vegetable or

Factory-Built Houses

Of TVA Sectional Design

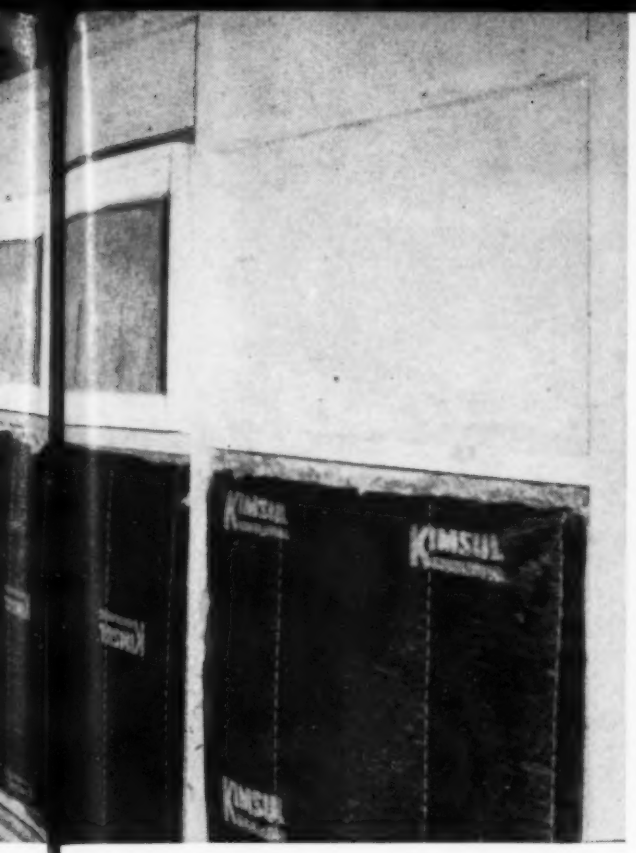
Provide Thousands of War Homes

PRESSURE OF WAR DEMANDS has accelerated factory production of mobile prefabricated houses, designed by the Tennessee Valley Authority for highway shipment in complete sections without dismantling, ready for quick assembly in the field. The trend is exemplified by the production-line techniques employed in six factories which received contract awards from a government agency for several thousand houses, fabricated according to TVA plans, to be delivered to prepared foundations at two war projects. Peak production during the contracts varied by companies from 4 to 17 two-bedroom houses a day, and the total maximum output of the six firms was equivalent to about 55 two-bedroom houses per day. Accompanying photographs illustrate production procedures in two manufacturing plants.

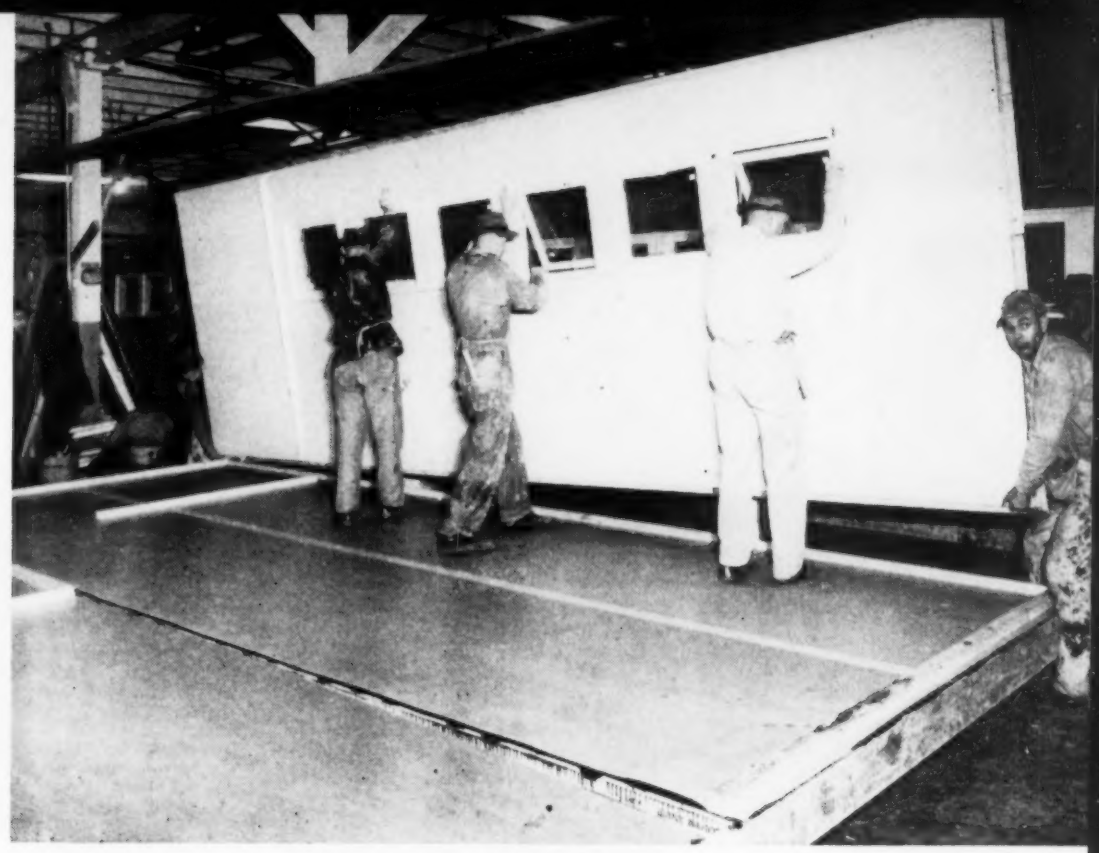
Sectional Houses — Following TVA's development of the first sectional houses

ROOF PANELS (below) of 8x28-ft. size, framed and surfaced with plywood on jig table at left, are moved to table at right for application of canvas roofing. These panels are stressed-skin units, with plywood sheets ¼ in. thick glued and nailed to frames. Powdered casein glue is used for all glued connections in housing panels. Roofing consists of chemically treated moisture-proof and mildew-proof cotton duck roof and deck canvas laid in heavy coat of special bedding paint. Canvas is given one heavy prime coat of water-repellent protective sealer and two coats of best grade yacht deck enamel.

HOUSE SECTION (below) riding on track dollies takes shape as partitions are erected and roof panel is moved into position on trolley hoists for



wood fiber wool or equivalent in all exterior panels. 1½-in. blanket for walls and 2-in. blanket for roof and floor. Wall panel shown here already has been fitted with window frames and sash.

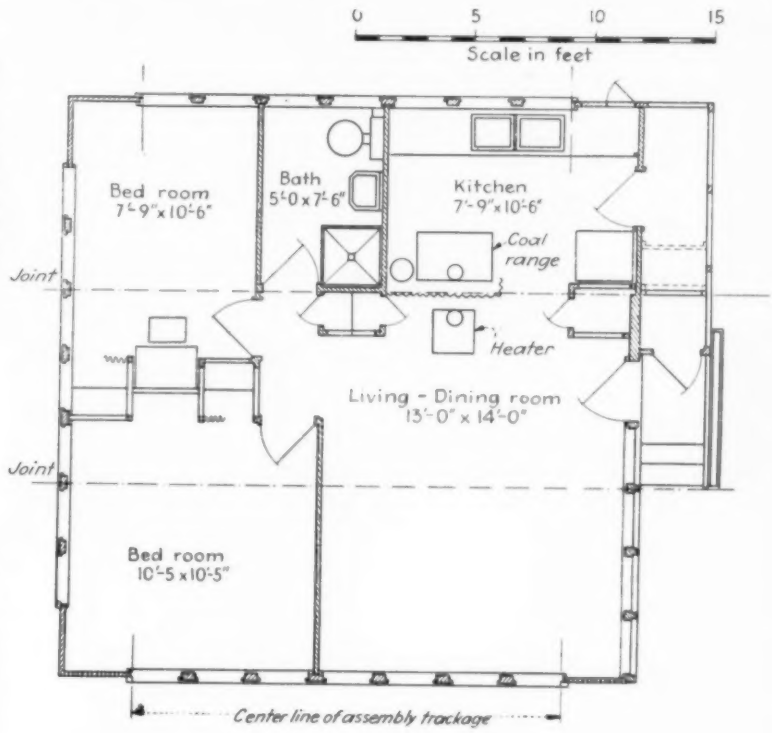


FIVE MEN lift wall panel and place it over cleat provided on floor panel. Plywood sheets of wall panel will be nailed to cleat. Linoleum on floor has been covered with protective paper which will not be removed until after house has been assembled in field.

and of a central fabricating yard for producing 150 dwelling units of this type (CONSTRUCTION METHODS, May, 1941, p. 70, and October, 1941, p. 62), the Authority designed a house for factory fabrication and awarded a contract for 100 one-bedroom, two-section houses to be delivered to Fontana Dam, in North Carolina. These houses were constructed largely of plywood, a material adaptable to prefabrication and capable of contributing structural strength. By utilizing the stressed-skin principle of construction, with plywood sheets glued to the framing of roof and floor panels particularly, thus taking advantage of the structural strength of the plywood in these fabricated units, the house sections were made lighter in weight than those previously built by TVA forces. The light sections could be more easily handled at the factory, during transport, and in the field.

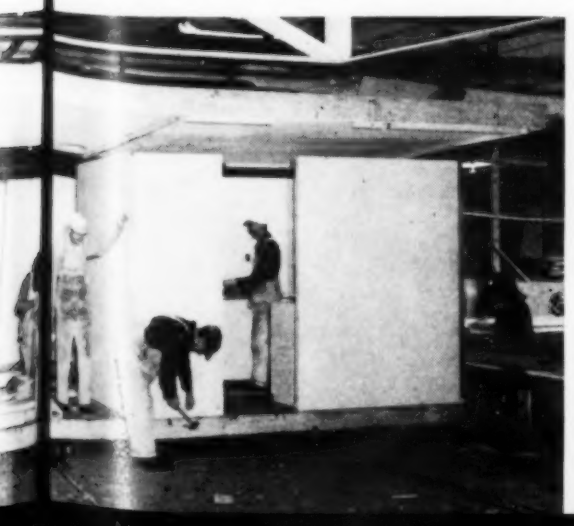
These houses were equipped with spe-

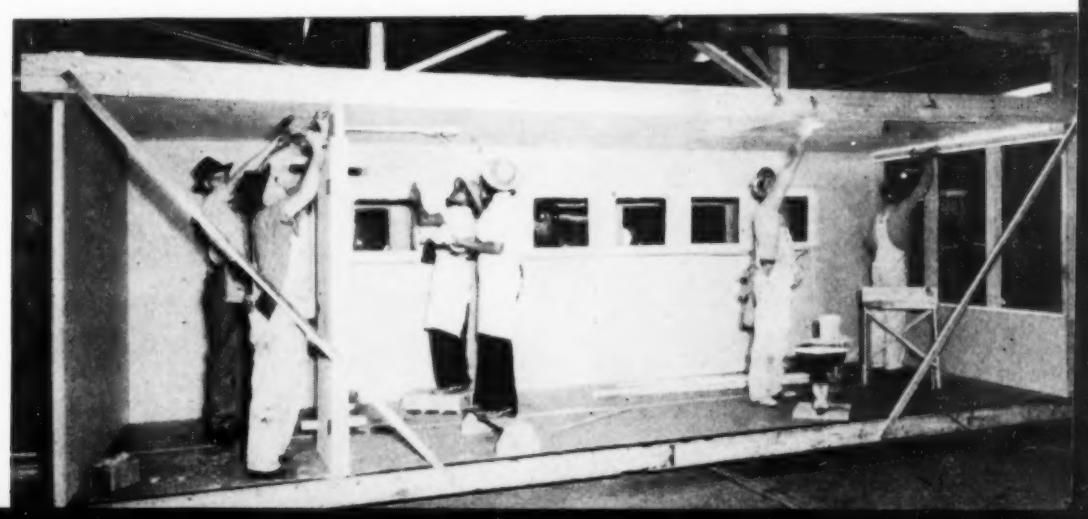
TWO-BEDROOM HOUSE (right) comprises three 8x24-ft. sections plus added space for storage off kitchen and at entrance, making overall dimensions about 24x27 ft. Complete equipment and specially designed furniture are installed by manufacturer before sections leave factory.



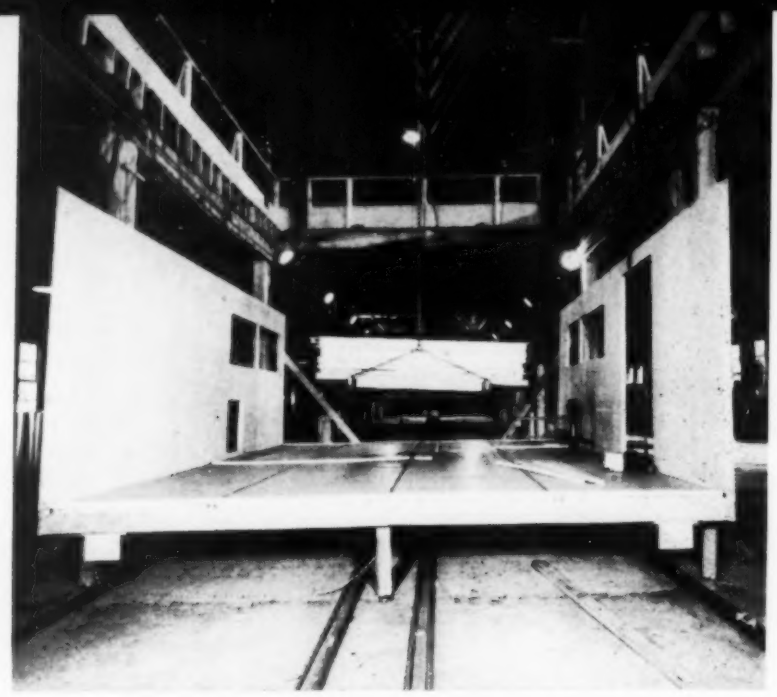
CARPENTERS AND ELECTRICIANS (below) complete interior work while painter applies ceiling coat. House sections are completely fitted with plumbing and electrical installations before leaving assembly line. In field, adjacent edge members of housing sections will be bolted together to form assembled unit.

lowering. Cleats to receive partition panels have been glued and nailed to ceiling sheets. Workman in room at right is installing kitchen equipment.

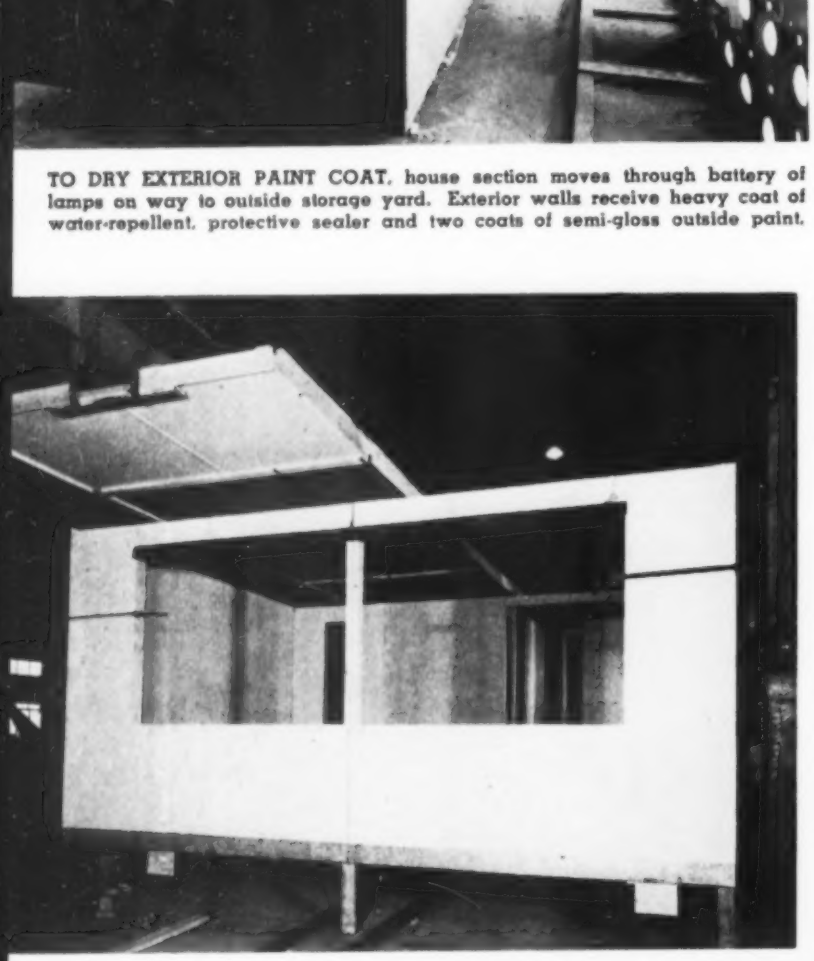




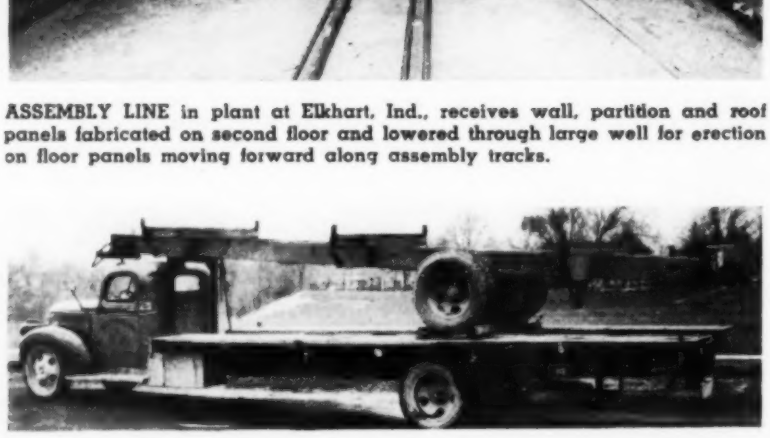
TO DRY EXTERIOR PAINT COAT, house section moves through battery of lamps on way to outside storage yard. Exterior walls receive heavy coat of water-repellent, protective sealer and two coats of semi-gloss outside paint.



ASSEMBLY LINE in plant at Elkhart, Ind., receives wall, partition and roof panels fabricated on second floor and lowered through large well for erection on floor panels moving forward along assembly tracks.

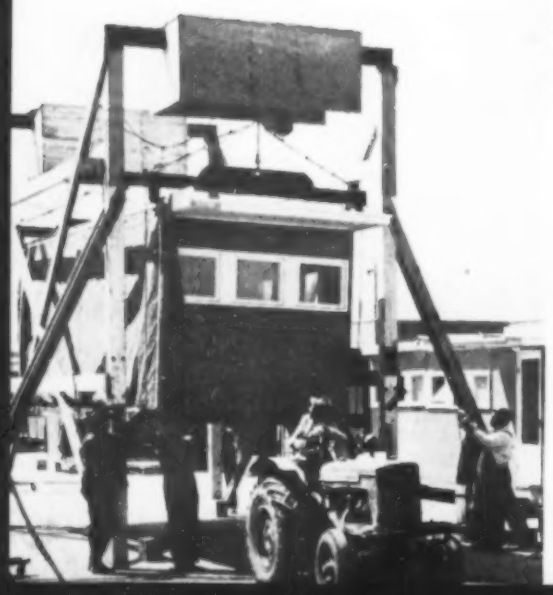


CEILING SURFACE of roof panel has been painted white and masked before panel is lowered through floor well onto erected wall panels of house section. Interior walls will be finished with clear or pigmented lacquer sealer when section rolls through paint spray shop.



READY FOR RETURN TRIP to factory, truck picks up and carries trailer.

TWO HOUSE SECTIONS on truck-trailer combination arrive at housing site after 400-mi. trip. Tarpaulins protect house sections from dust and weather.

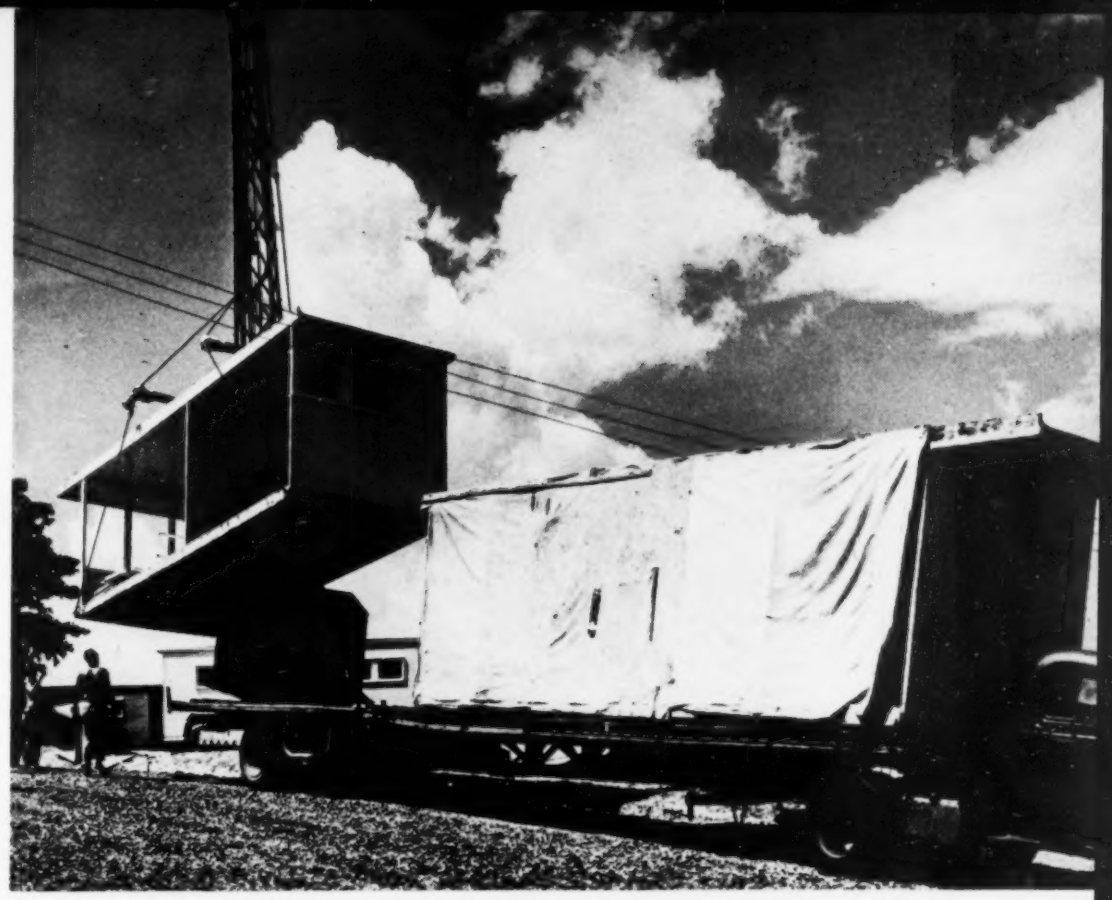


HOUSE SECTION (left) is picked up by electric hoists preparatory to loading on truck-trailer for highway shipment.

cially designed furniture, both built-in and movable, the first time that furniture had been supplied with the dwelling units. The tenants approved highly of the fully equipped one-bedroom houses. Prefabrication on a complete basis, including furniture in addition to mechanical equipment, concentrated production responsibilities in the factory. Less than 10 percent of the cost of the Fontana houses, including foundations, was represented by field work. By elimination of most of the on-site construction, houses could be provided quickly even in periods of bad weather. As a further advantage of the sectional construction, a house could be easily, quickly and cheaply moved from its original site to a new one.

Success of the factory-produced one-bedroom house spurred TVA architects and engineers to undertake the design of two- and three-bedroom houses in three and four sections, respectively. Extensive studies were made to develop a sound basis for prefabrication. These investigations led to an arbitrary decision that standardization of pieces rather than of panels would be the goal. It was agreed that reasonable standardization in the basic bill of materials would permit

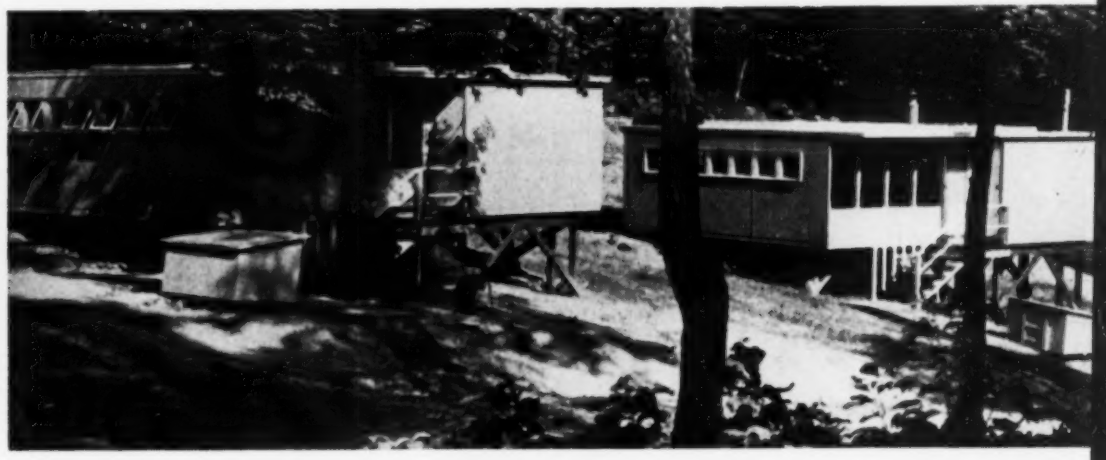
(Continued on page 156)



USING TWO STRONGBEAMS to pick up load, crane lifts house section from large flatbed trailer and swings it into position on foundations.

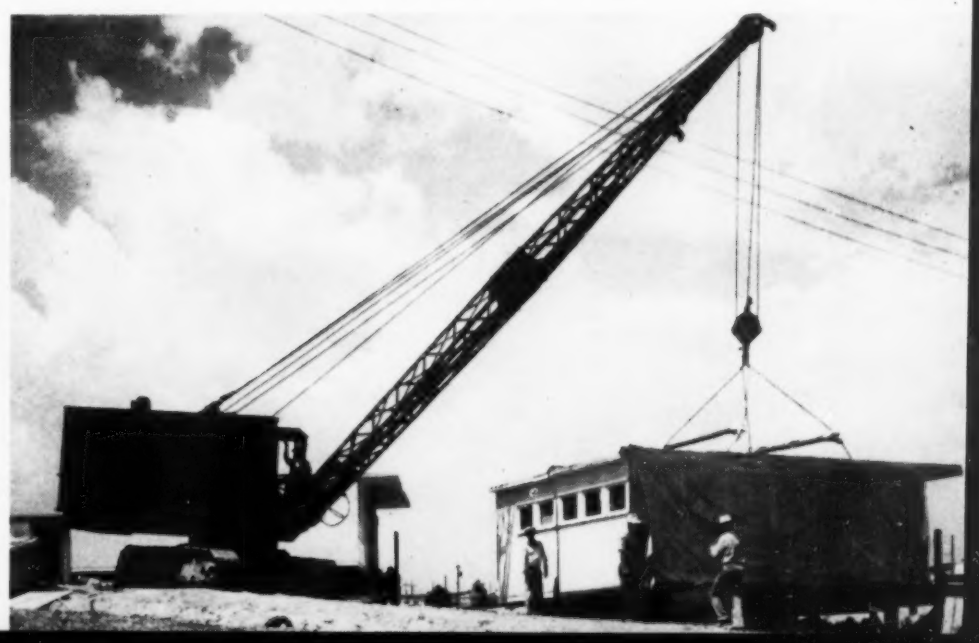
THREE-SECTION HOUSES (below) containing two bedrooms each are factory-fabricated in large volume for war projects.

PREFABRICATED SECTIONAL HOUSES purchased from contractor by TVA arrive at site complete with plumbing, electrical work, fixtures, equipment and furniture; even draperies are in place at windows. Five-man crew unloads house and makes it ready for occupancy in less than half a day.



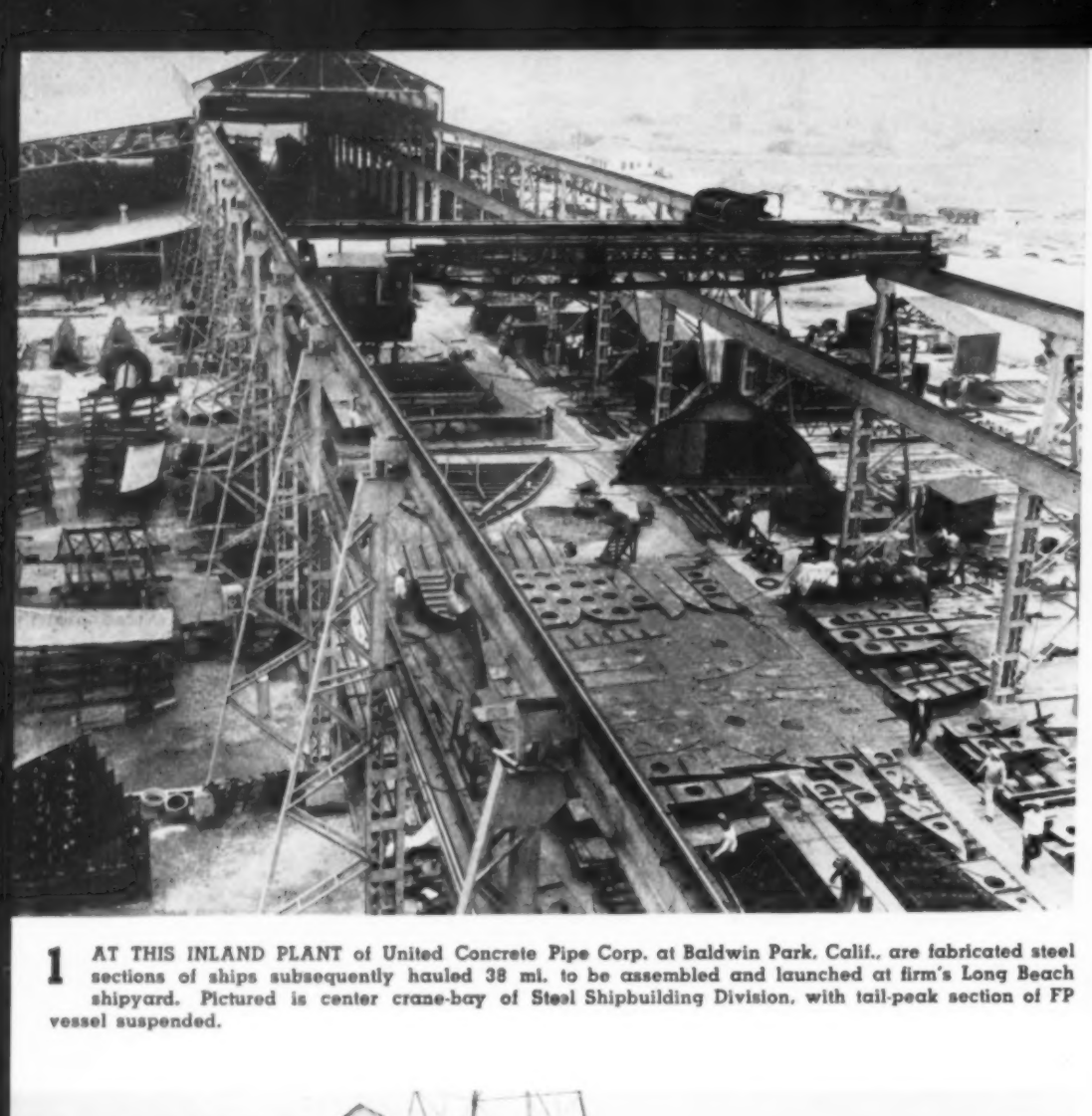
SECOND SECTION (below) of three-section house isplaced by crane on foundations adjacent to section previously unloaded. When third section is in place, trained assembly crew bolts sections together and makes connections to utilities. In few hours, house is ready for occupancy.

THREE-BEDROOM HOUSE consists of four factory-fabricated sections, hauled to site and bolted together on foundations.



Step-by-Step Field Methods

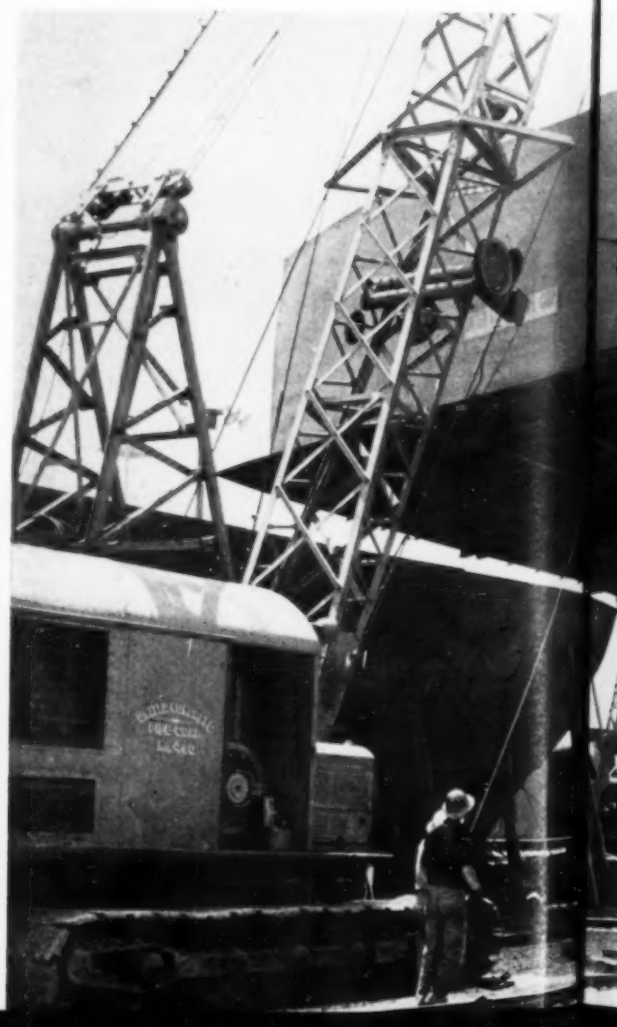
SHIP SECTIONS Hauled 38 Miles From Inland Plant To Tidewater Assembly Yard

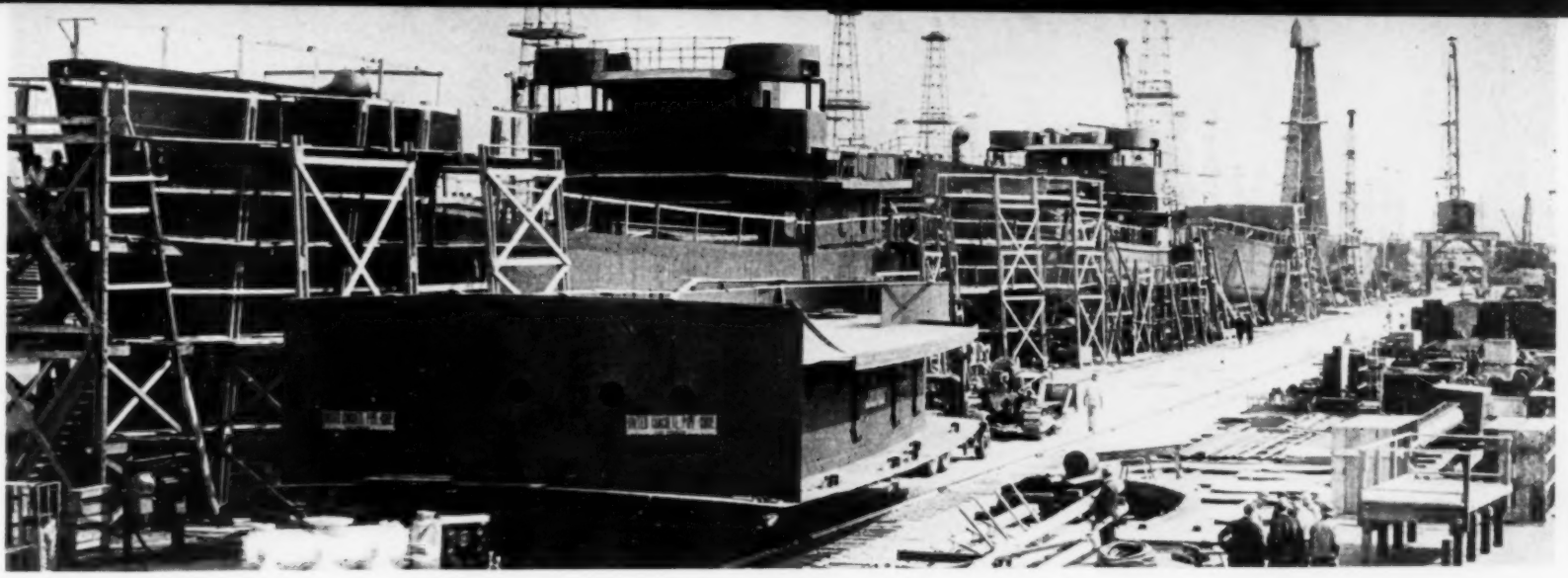


1 AT THIS INLAND PLANT of United Concrete Pipe Corp. at Baldwin Park, Calif., are fabricated steel sections of ships subsequently hauled 38 mi. to be assembled and launched at firm's Long Beach shipyard. Pictured is center crane-bay of Steel Shipbuilding Division, with tail-peak section of FP vessel suspended.

2 40-TON DECK-HOUSE for 175-ft. U. S. Army FP is loaded on truck and trailer at United Concrete Pipe Corp., Steel Shipbuilding Division, plant at Baldwin Park, Calif., ready for 38-mi. trip to Long Beach.

3 CONVOY OF TRUCKS (below) carrying parts for Army vessels arrives at Long Beach shipyard. These parts were pre-fabricated in Baldwin Park, 38 mi. inland.





4 **AFTER BEING HAULED** from inland plant, deck-house, aboard truck (below), is moved into position for lifting into place on Army FP ship at company's Long Beach shipyard. Also shown is end-to-end method of ship production made possible by use of large marine railway.

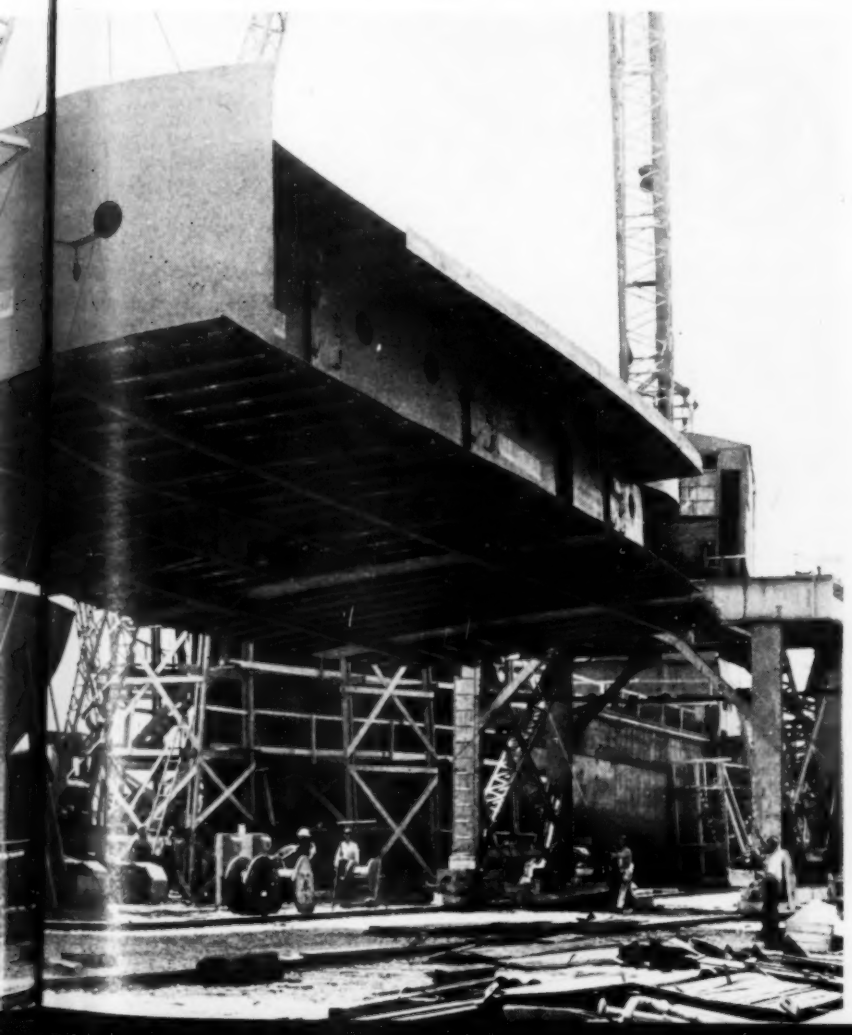
ON A COAST dotted with diversified shipyard operations, one of the most unusual is that of the United Concrete Pipe Corp., Steel Shipbuilding Division, of Baldwin Park, Calif., which builds ships in sections, 38 mi. from tidewater and trucks the sections to its Long Beach harbor yard where they are assembled, moved onto a marine railway and launched. Peacetime builders of concrete pipe sections, aqueducts, railway bridges and tunnels, United Concrete Pipe Corp. now turns out U. S. Army inter-island type FP (freight and passenger) vessels 175 ft. long with a 30-ft. beam.

Fabrication work on ship parts is done at the company's Baldwin Park plant, 38 mi. inland from the Los Angeles-Long Beach harbor. These parts—keel sections, bulkheads and deck houses—some weighing more than 40 tons—are transported in truck and trailer convoys to the shipyard where they are erected on building slabs in what closely approaches "production line" methods of operation.

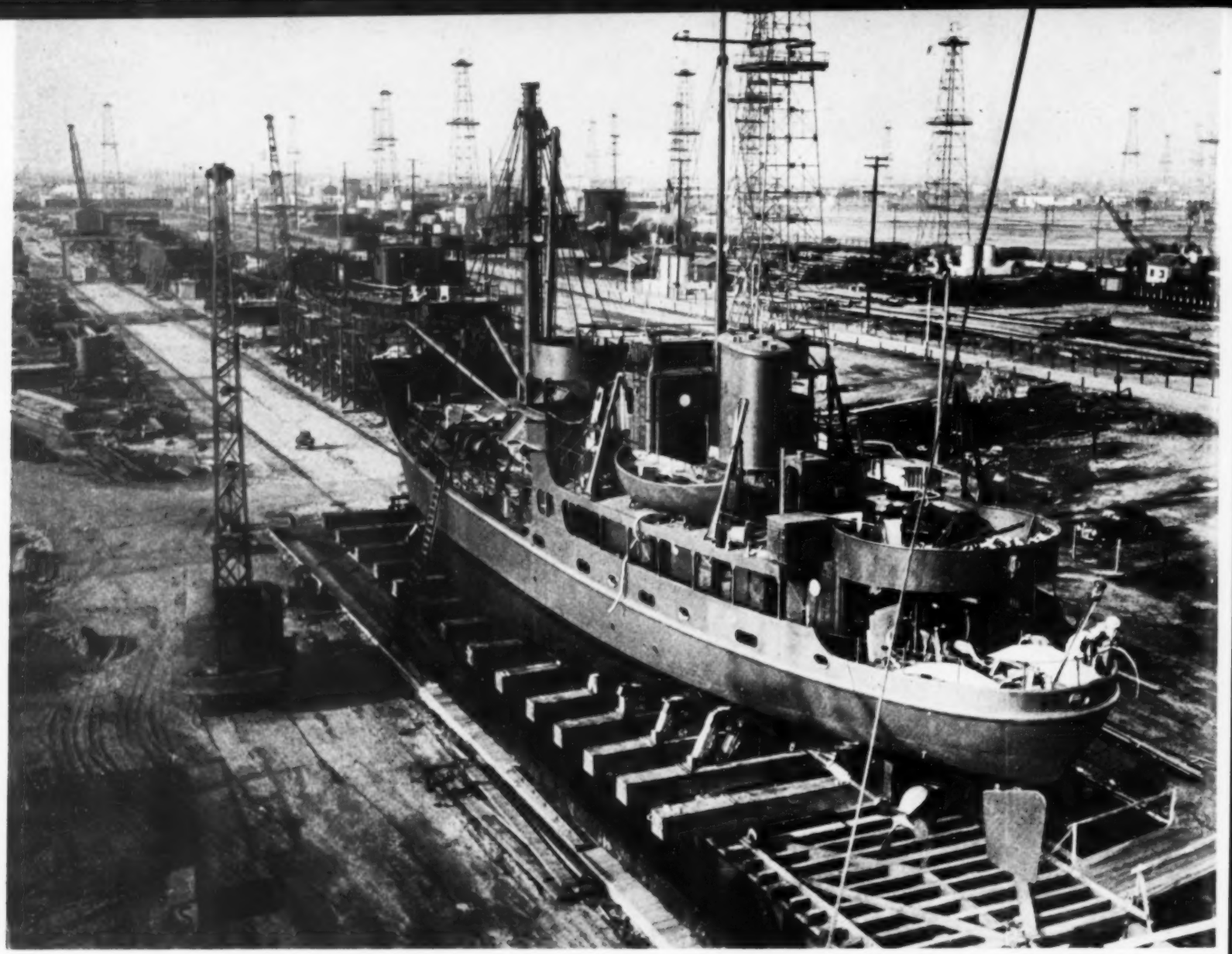
The firm's elongated yard stretches 2,250 ft. in length between two rows of oil derricks 215 ft. apart on the outskirts of Signal Hill. Six building slabs are used in the yard employing more than 1,000 men.

When a ship is ready to launch, it is moved sideways from the building slab onto the marine railway by house-moving apparatus. The railway then moves it towards the water until it rests on a

5 **THREE CRANES** (below) lift deck-house into place on ship being assembled on one of six building slabs at United Concrete Pipe Corp.'s Steel Shipbuilding Division yard.



6 **READY FOR LAUNCHING** (below) ship is moved sideways from building slab on which it was assembled onto marine railway by means of house-moving equipment.



7 **MOVED ON LAND EXTENSION** of marine railway to platform which lowers it into water, this Army FP vessel is shown preparatory to launching. During operations of moving it onto railway and transporting it to this launching cradle, altitude of ship above ground has not varied. In the background can be seen oil derricks which surround elongated yard.

8 **LOOKING DOWN SLIP** of marine railway (below), an FP hull is shown about to be launched. Marine railway, extending 488-ft. under water, will carry ship to harbor, where it will be eased into deep water.

9 **WITH ITS UNUSUAL ASSEMBLAGE** and launching completed (below), finished 175-ft. Army freight and passenger ship, destined for coastal and inter-island service, makes trial run in Los Angeles harbor.

launching cradle. This cradle is the portion of the railway which carries the ship down into the water.

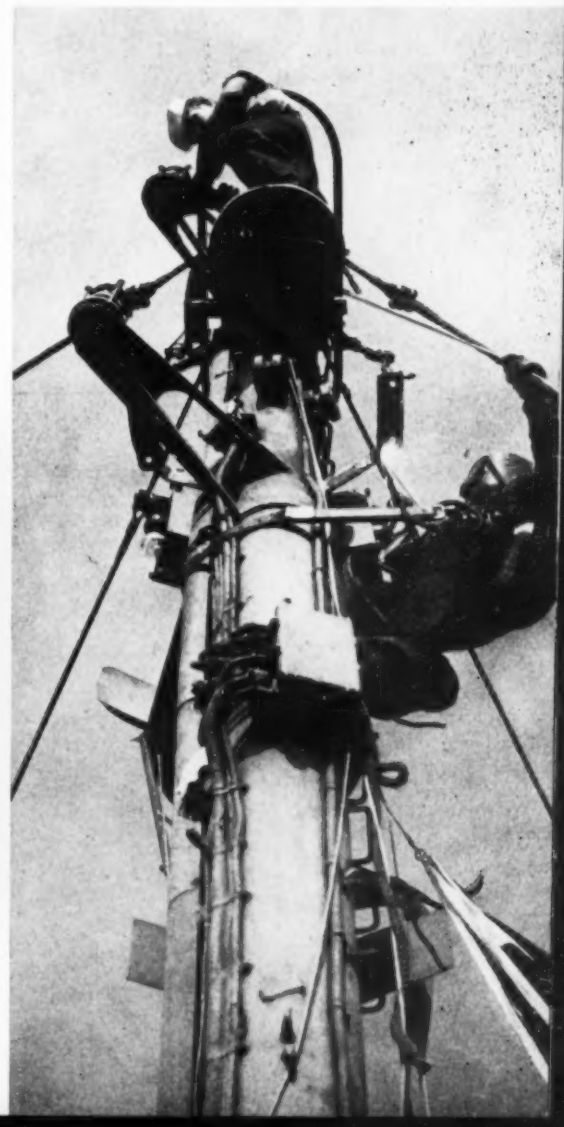
One of the largest on the West Coast, the marine railway has a capacity of 1,500 tons and can handle a ship 225 ft. long with a 40-ft. beam. Designed by Milton Shedd, United Concrete Pipe Corp. engineer, the railway can be used for lifting ships from the water for repair work, as well as for launching. It runs 488 ft. under water and has a 1,400-ft. land-side extension.

JOB oddities

TO KEEP WARM IN ICELAND, natural hot water (170 deg. F.) is piped from hot springs 10 mi. away to central heating system of each house in capital city of Reykjavik. Here workers insulate one of mains with dried turf kept in place by wire netting. Wide World Photo

ONE OF GREATEST EXPLOSIONS ever set off on construction project tears down 400-ft. cliff and provides 650,000 tons of rock for TVA's 460-ft. high Fontana Dam. Blast required 208,700 lb. of explosives. Scheduled for completion this year, this dam on Little Tennessee River will add 200,000-kw. to installed capacity of TVA system.

WELDING UNDER DIFFICULTIES (right) is performed by member of U.S. Navy's ship repair unit, here shown working atop mainmast of destroyer. U. S. Navy Photo

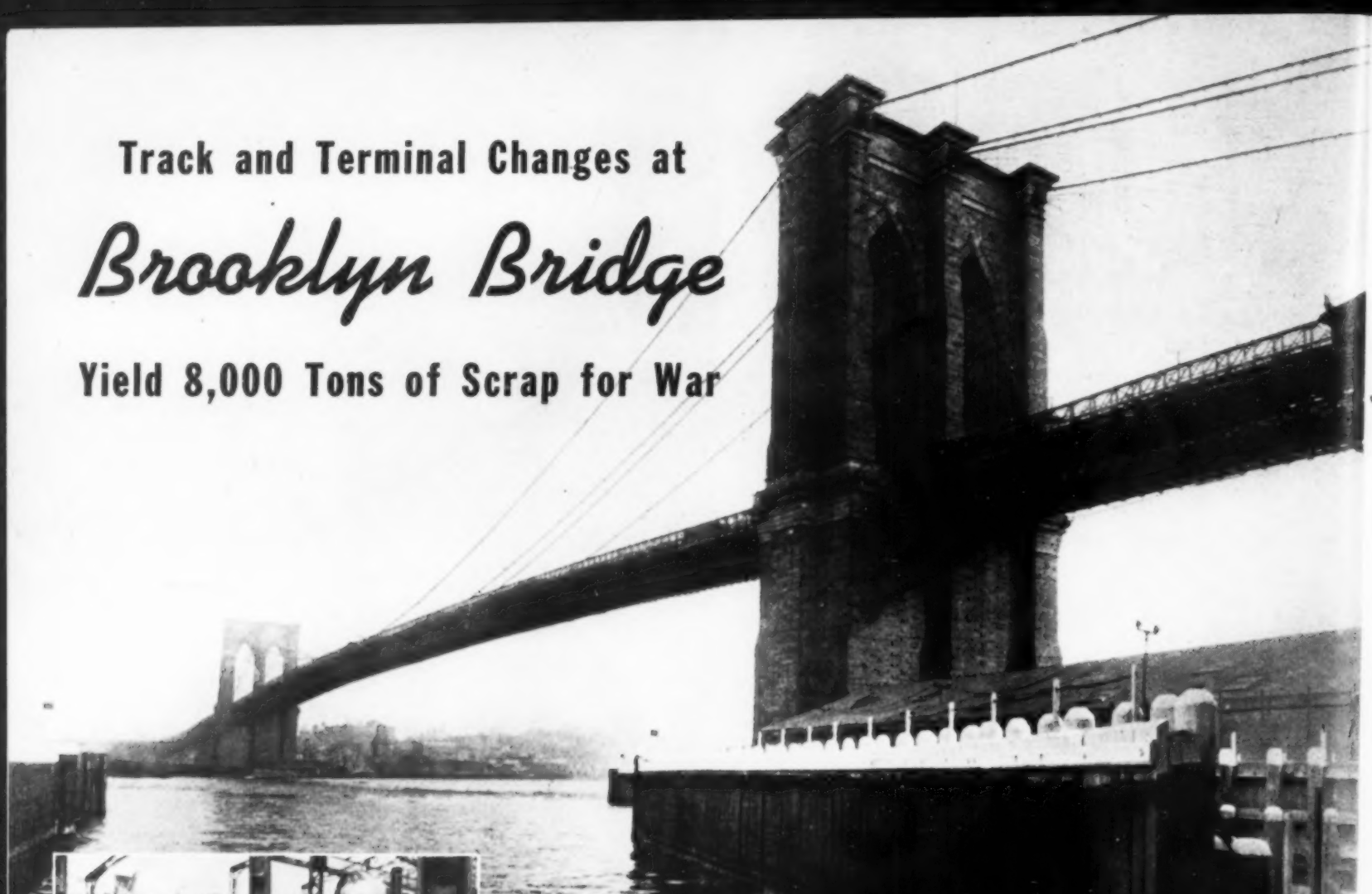


REFRIGERATED CAVE (below) is being made by federal government from this huge limestone vault at Atchison, Kan. This underground icebox on high bluff overlooking Missouri River will be fitted with refrigerating units to store 3,500 train carloads of perishable food for War Food Administration. Wide World Photo

Track and Terminal Changes at

Brooklyn Bridge

Yield 8,000 Tons of Scrap for War



BROOKLYN BRIDGE, 61 years old, is cable suspension structure with main span of 1,595½ ft. across East River, New York City. Photo, Roebling

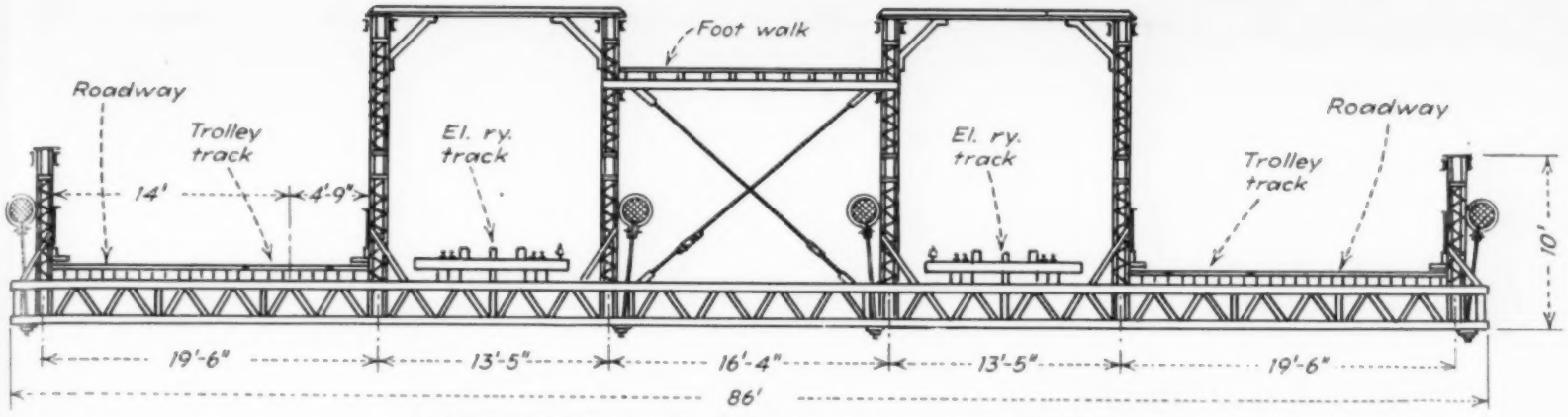
KEY MEN in smooth functioning between two city agencies are Department of Public Works' JOHN H. DOOLEY, resident engineer, and Board of Transportation's W. H. STUART, project engineer.

SCRAP METAL amounting to 8,000 tons is being made available for war purposes in a $1,650,000 project of clearing the existing vehicle roadways of trolley operation by altering the trolley track layout and improving the terminal facilities of Brooklyn Bridge, 61-year-old cable suspension structure with a main span of 1,595½ ft. across the East River between Manhattan and Brooklyn, New York City. Completed in 1883 after 13 years of construction work beset by many difficulties and requiring the solution of problems without precedent at that time, the bridge and its approaches are being adapted to present-day traffic needs by the joint efforts of New York City's Department of Public Works and Board of Transportation. In addition to alteration of the bridge tracks, the project includes the razing of Brooklyn elevated structures and the removal of obsolete and unsightly terminal structures at both ends of the bridge.

For every 500 tons of steel razed only 20 tons are to be utilized for reconstruction. Ingenious methods and elaborate safety precautions have been devised to keep the work going without interruption to trolley and vehicular traffic.

During recent years the width of the bridge deck has been occupied by a central footwalk for pedestrians, flanked on each side by a single track for elevated railway trains and a two-lane roadway containing a track for trolley cars. The improvements now under way provide for eliminating elevated railway service over the bridge and utilizing the inner pair of tracks for trolley car service. The trolley car tracks will be subsequently removed, leaving the roadway clear for vehicular traffic only. Present-day subway service under the East River be-

PART OF TWO MILLION FEET of scrap lumber (below) is seen here on deck of Park Row Terminal, in early stages of demolition.



CROSS-SECTION of Brooklyn Bridge showing transit facilities and footwalk

tween Manhattan and Brooklyn, nonexistent when the bridge was built, handles so much of the traffic between the two boroughs of the city that there is now no justification for maintaining elevated railway service across the bridge. Removal of the old terminal structures will make possible the future widening of the approaches to the bridge.

Two Separate Contracts

Improvement work on the approaches of Brooklyn Bridge and the razing of the antiquated station structures at its terminals is being done under contract by E. W. Foley, Inc., of Brooklyn, at a low bid of $773,000 for labor and certain small materials not furnished by the city. A complementary project amounting to $242,000 and involving the razing of elevated railway structures near the bridge terminal in Brooklyn and work on the Bridge-Jay St. station is being handled by the Atlas Tile & Marble Works, Inc., for whom the Albert A. Volk Co. is doing demolition work under a sub-con-

CONCRETE BREAKER GANG (right) removes strip on last deck of Manhattan Terminal. Water hose is used constantly to keep down cement dust.

CRAWLER CRANE (below) with 1½-cu. yd. bucket begins removing debris from old elevated roadbed near Manhattan Terminal, while motor vehicle and trolley car traffic continues to operate.

PARTLY STRIPPED Manhattan Terminal (below). New construction will extend to existing promenade level involving cutting away of heavy timber and steel structure and remodeling of track.

BROOKLYN APPROACH, looking north during progress of demolition in May, 1944. Unsightly storage deck and terminal will be transferred into parkway, while tons of vital material find their way to steel mills. At right of Brooklyn Bridge is Manhattan Bridge.

TO SAVE FLOOR BREAKAGE at proposed traffic level, 1½-ton International tractor employs rubber tires and 6-ft. bulldozer blade to push scrap into chute leading to ground floor on Brooklyn side.

SIMPLE POLE RAISING DEVICE lifts 28-ft. sectional type trolley pole of rolled steel to be deposited in concrete base box 2 ft. x 3 ft. wide and 6 ft. deep. Scaffold platform is raised by compressed air.

tract. The Board of Transportation, to which the contractors are responsible, furnishes all new heavy materials, amounting to more than $300,000, other than salvage.

World Famous Structure

Brooklyn bridge across the East River, New York City, ranking among world-famous engineering structures, was formally opened to the public May 24, 1883. John A. Roebling was selected as chief engineer of the project on May 23, 1867. A board of distinguished consulting engineers reviewed Mr. Roebling's plans for the bridge and reported in May, 1869, that "it is beyond doubt entirely practicable to erect a steel wire suspension bridge of 1,600 ft. span, 135 ft. elevation, across the East River." Construction was started by the award of a contract on Oct. 25, 1869, for a timber caisson for the Brooklyn tower; the first cable suspension wire was run April 5, 1877. Construction of the suspended steel superstructure was begun in January, 1881, and the bridge was completed two years later at a cost of $15,000,000.

The stone masonry towers of Brooklyn Bridge are 272 ft. above mean high water and the main cable suspension span is 1,595½ ft. Length of each side span is 930 ft. Length of Manhattan approach is 1,562½ ft. and of the Brooklyn approach, 998 ft. Total length is 6,016 ft. Overall width is 86 ft. The structure has four supporting cables, each 15¾ in. in diameter and each containing more than 5,000 galvanized steel oil-coated wires.

As originally built the suspended steel superstructure consisted of six longitudinal stiffening trusses and transverse lattice girders spaced 7½ ft. apart to sup-

OPERATING ALONGSIDE STRUCTURE Koehring crane (below) with 80-ft. boom and 20-ft. jib prepares to lift cut roof members from old and unsightly terminal in Brooklyn.

SAFETY PRECAUTIONS are provided against lead paint fumes in this burner's use of torch with 4-ft. handle, and canister respirator containing activated charcoal and sand, strapped to back as he cuts through joint ahead of crane. Burners with crane cut remaining strip after sling has been installed and drawn taut.

TROLLEY LINE TROUGH is constructed of long-leaf yellow pine to carry 8,000 ft. of wire across bridge over old Elevated roadbed.

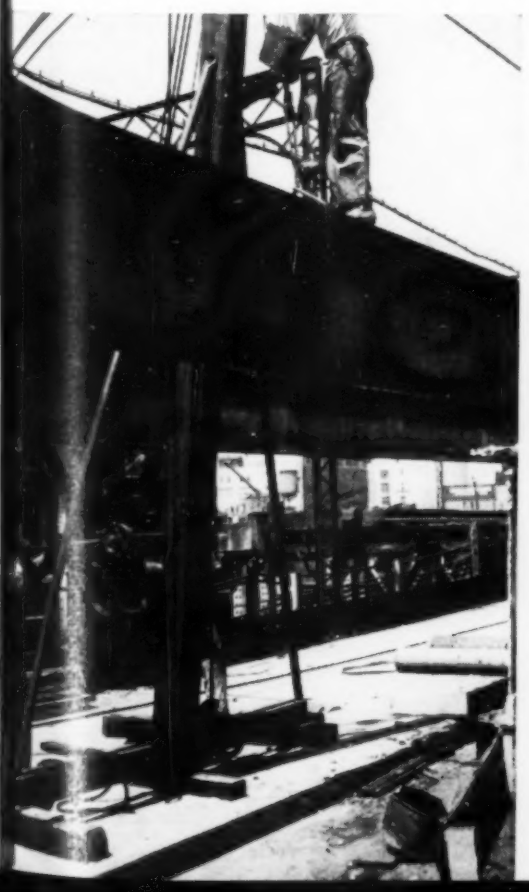
CONCRETE ALONG OLD SUBWAY WALLS is removed by 15-ton P&H crane and hook sling. Manhattan terminal structure, in background, is being razed.

port the bridge deck. The 86-ft. overall width of the bridge was divided by the six main trusses into five lanes. The central lane, 15 ft. 7 in. wide, was occupied by a footwalk or elevated promenade. It was flanked on either side by 12-ft. 8-in. strips occupied by railway tracks, while the outer lanes on each side of the deck provided widths of 16 ft. 9 in. for vehicle roadways, paved with wood plank.

Current improvement operations began in February, 1943, under the Atlas Tile & Marble contract, which called for the razing of the Brooklyn elevated structure along Adams St. for three blocks and along Sands and High Sts. for one block, and the removal of the loop end of the terminal building and a portion of the "storage deck" at Tillary St. An average of 200 men were employed. The required tonnage of usable steel removed from existing structures was refabricated and used in the construction of a mezzanine which was slung beneath the existing terminal structure at Jay St. to provide a terminal deck for existing elevated traffic. Permanent trolley lines were reconstructed to serve the area around the Brooklyn Bridge plaza. New ramps were built, stairways, signal towers, telephone and signal work installed, and the sta-

(Continued on page 162)

HOUSE DERRICK OR DUTCHMAN (below) lifts 6-ton girder from its resting place to rollers on deck of Brooklyn Bridge.



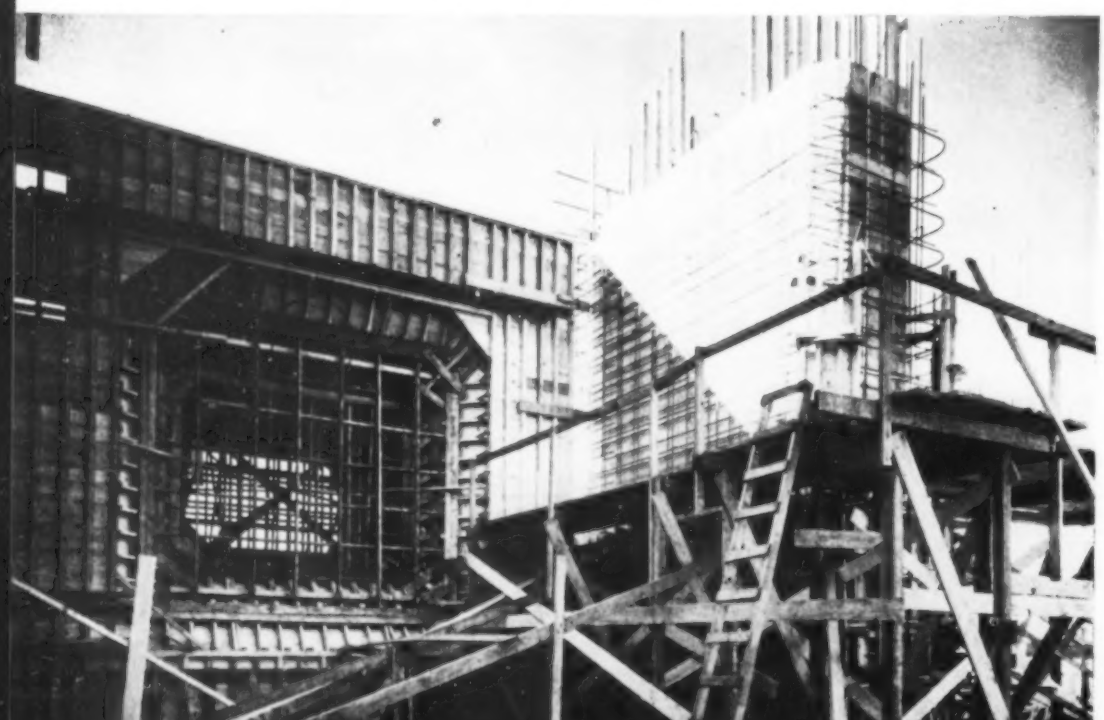
SIX-TON GIRDER (below) is rolled away to street level along second deck after house derrick has lowered and placed it on rollers.

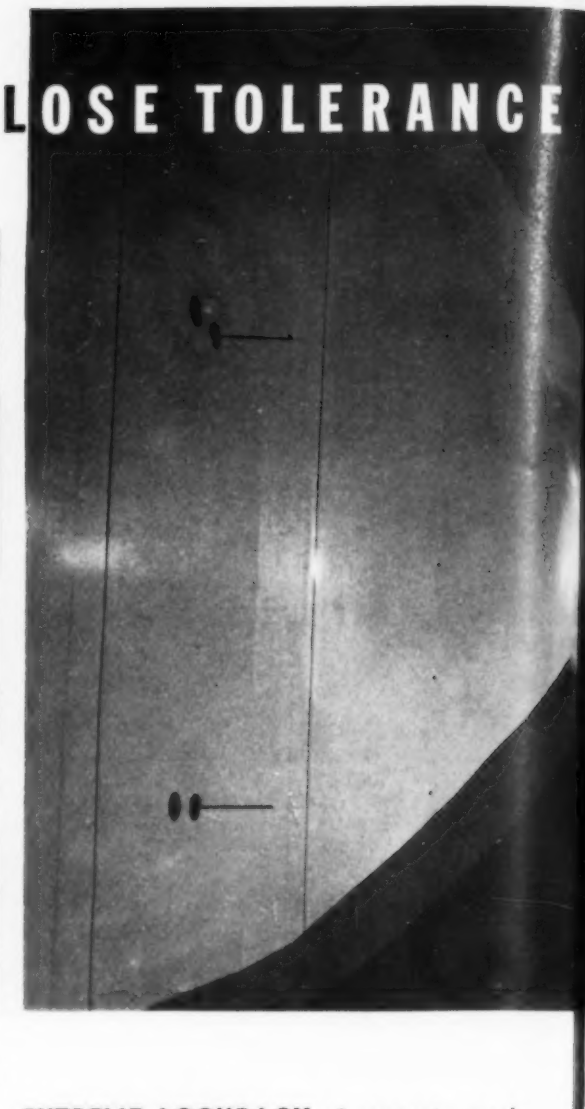
TYPICAL STRIPPING OPERATION (below) is shown as this Koehring crane with 60-ft. boom reaches up from street level for dismembered girder.

Precision Forms MEET CLOSE TOLERANCE NE

PRECISION FORMS are erected for 450-ft. long reinforced concrete wind tunnel. Tolerances of 5/16 in. are permissible in this area, as compared with ⅛-in. tolerances in bellmouth and test area, forms for which are in place in right background.

HEAVY BRACING (below) is required in form work around test section, demanding ⅛-in. tolerances.



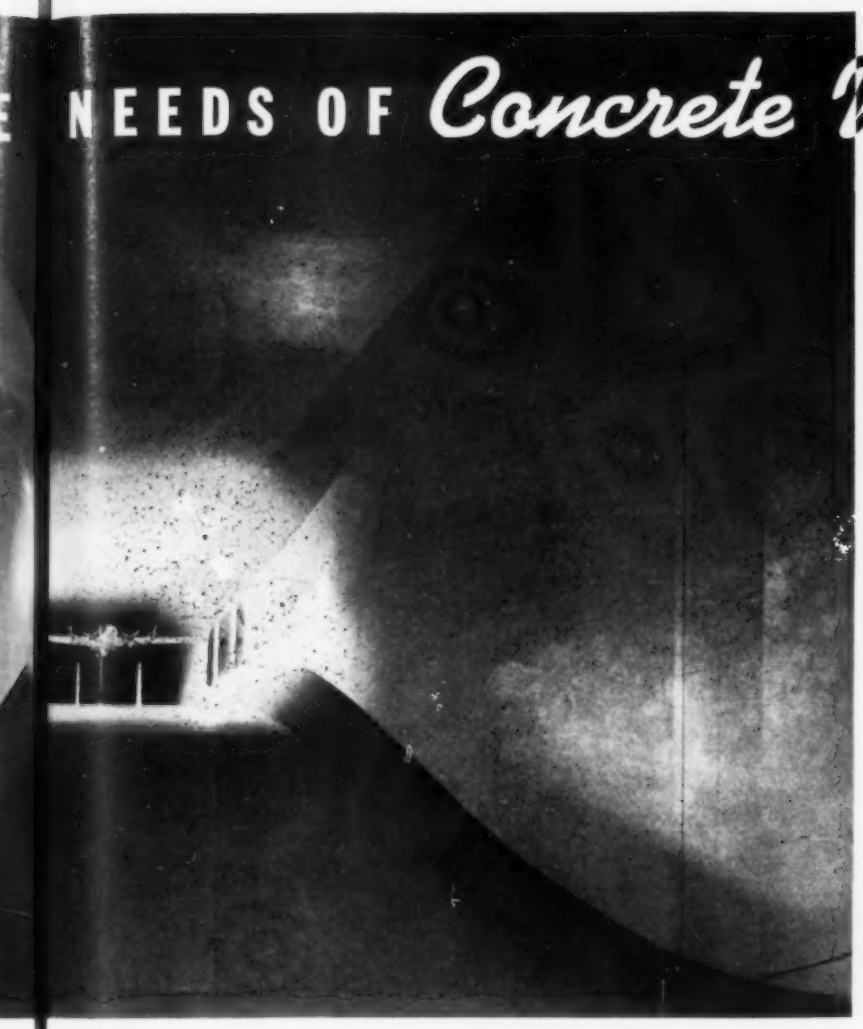


EXTREME ACCURACY of concrete work was achieved by The Austin Co. in constructing for the Boeing Aircraft Co., of Seattle, Wash., a wind tunnel for areodynamic research involving air velocities as high as 700 mph. Tolerances of ⅛ in. were maintained in the bellmouth of the 450-ft.-long continuous-return reinforced concrete tube of approximately rectangular cross-section by ingenious design of precision forms. At the test section, or throat, the tunnel is 12x8 ft., with 2-ft. corner fillets. From here it increases in size to the first corner, where the dimensions are 20x20 ft.; it is the same at the second corner. At the nacelle, which incloses the power plant and huge motor-driven fan, it changes to a circle of 24-ft. dia. Approximately 100 ft. from the nacelle, the cross-section increases to a maximum of 27½x27½ ft. In a length of 25 ft., the size is again reduced to 12x8 ft. at the test section.

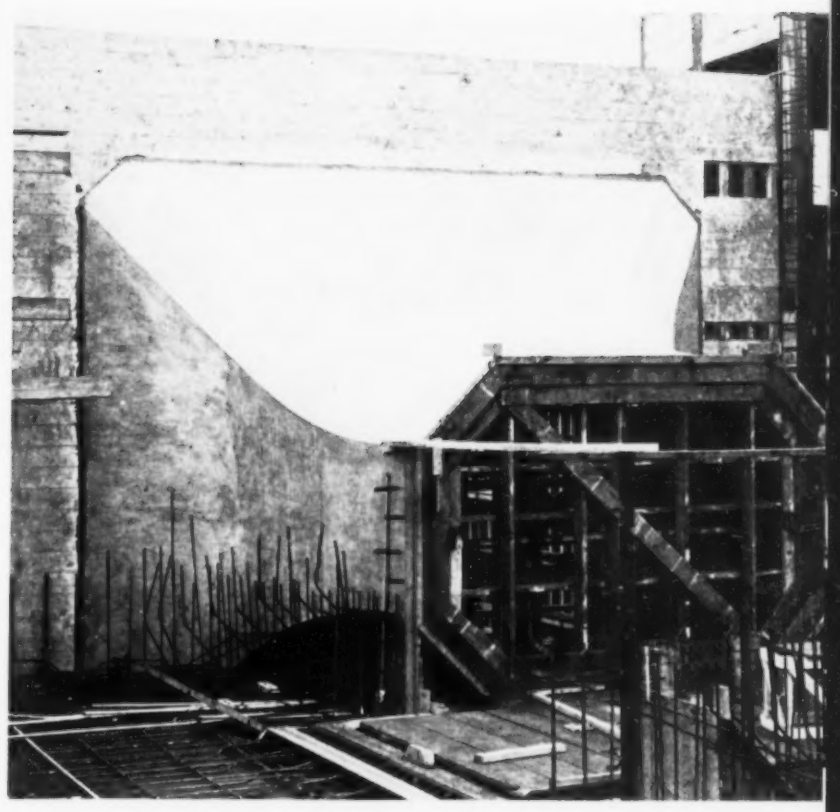
Bellmouth Formwork

As the tolerances for the construction of the concrete from the bellmouth through the diffuser section were confined to very close limits, with a permissible variation of 1/16 in. either way from the true dimension, considerable study was given to the formwork for the bellmouth. At various stages consideration was given to building the bellmouth oversize and putting on a plaster finish to the exact close dimension. At another stage, wood

NEEDS OF *Concrete Wind Tunnel*



MODEL AIRPLANE is mounted on special balances in test chamber of Boeing wind tunnel. Removable walls and ceiling cannot be distinguished from concrete tunnel itself. Small holes in walls, floor and ceiling are used to test air pressure, while vanes, made of 12-gage Armco ingot iron and extending from floor and right wall, aid measurement of wind velocity.



INNER FORM FOR BELLMOUTH is built of metal lath and plaster, heavily braced on inside, with heavy coat of lacquer and two coats of heavy wax given to plaster surface to make it smooth and waterproof. Erected on end in one piece, it was tilted into horizontal position as shown here, when entirely complete.

was considered in several different forms. One idea was to bend narrow strips of wood to the desired form and another was to build the form out of heavy laminated wood and then adz the form to the proper shape.

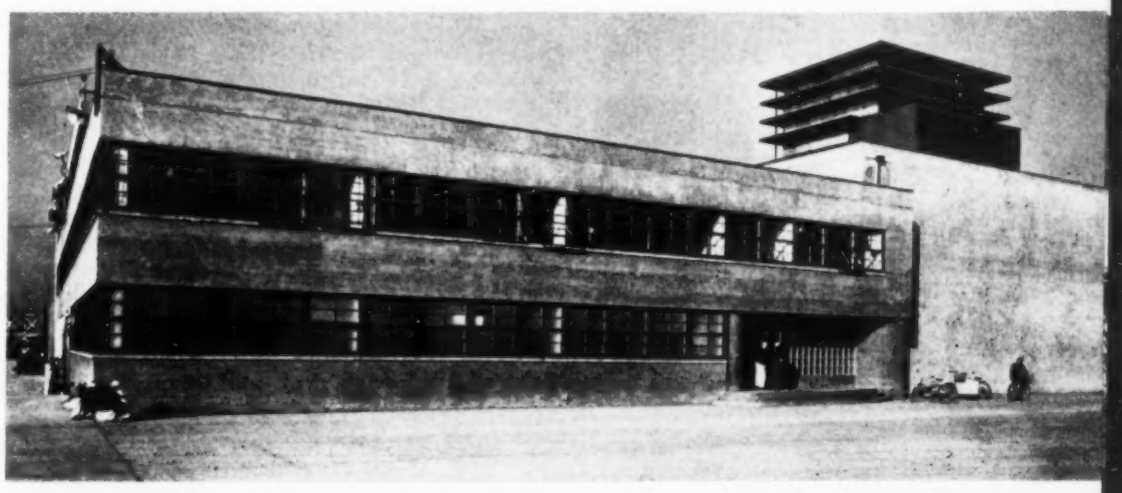
It was finally decided to build the inner form in a vertical position out of metal lath and plaster. This form was constructed in one piece, heavily braced, and was tilted from a vertical to a horizontal position. After the reinforcing steel for the walls of the bellmouth was in place, the exterior form was built. The floor was poured first, together with the side walls up to the floor of the test section and the remainder was poured in a later operation. The fillets in the entrance to the bellmouth, which were approximately 6 ft. measured along the center line of the tunnel, were built of wood covered with metal lath and plaster fitted against the shoulders of the walls, floor and ceiling.

From the diffuser section through the four corners to the bellmouth, the tolerance permissible in the formwork was 5/16 in. from the required dimension. The great variety of changes in sections and changes in fillets presented a constant problem in building the formwork, particularly fore and aft of the fan, where the sections change from rectangular to full circular and back to rectangular again.

The wind velocities vary from a maximum of 700 mph. at the test section to approximately 80 mph. at the third and fourth corners. The pressure at the test section under maximum wind velocity is 1,000 lb. per sq. ft. A steel pressure cap was, therefore, designed to inclose the test section. The skin of this cap is 3/16-in. plate reinforced with tees placed approximately 18 in. on centers. The tun-

(Continued on page 148)

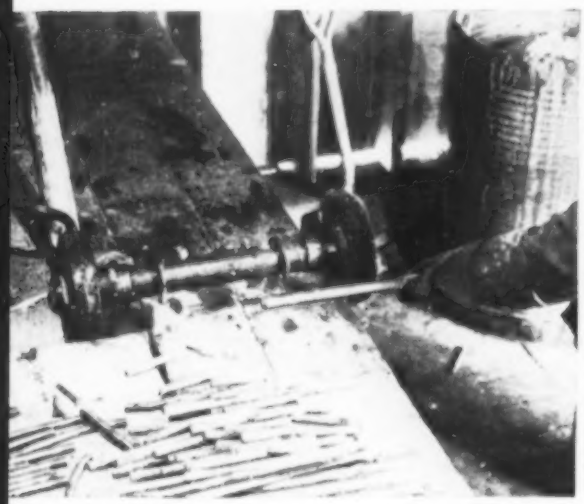
MODEL SHOP, offices, drafting rooms and operations area are housed in two-story reinforced concrete building (below) which adjoins, but is isolated from, wind tunnel. Dark-colored cement was used in interests of camouflage and paint conservation. Pagoda-like structure above tunnel (right) houses air interchanger. Laboratory is completely isolated from tunnel by expansion joint extending through floors, walls and roof. Continuous bands of wood sash extend around building.



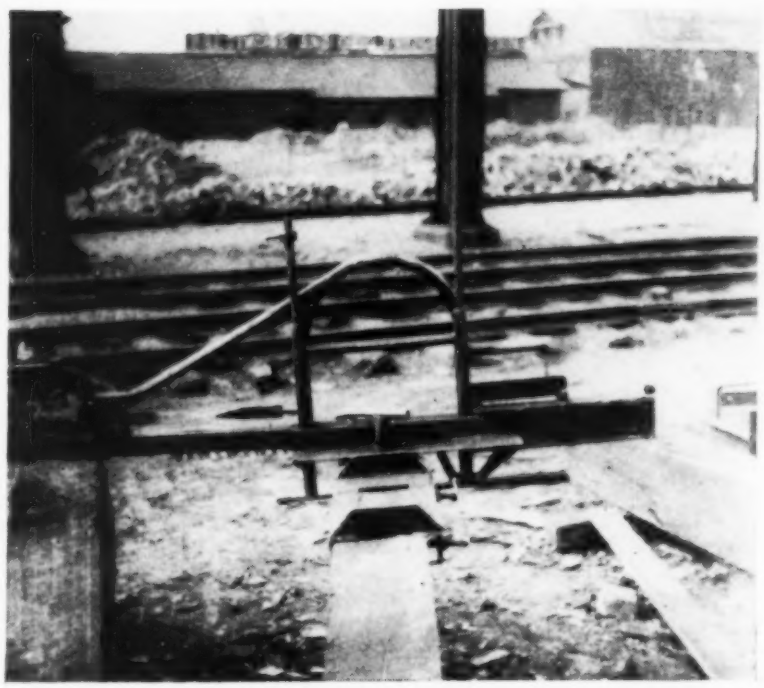
HOW They Did It

CONSTRUCTION DETAILS For Superintendents and Foremen

QUARRY LOADING OPERATIONS of Beyer Crushed Rock Co., of Kansas City, Mo., employ four International TD-9 diesel tractors with ½-yd. front-end loader. They are used not only in open for loading rock that goes to two big crushing plants but also for underground loading.



COMPRESSED AIR BUFFER cleans threads on shee bolts and tierods to permit their re-use at Keswick Dam, now being built at Redding, Calif., by Atkinson Kier Co., for U. S. Bureau of Reclamation. Built in contractor's shop, it is constructed from 1½-in. standard iron pipe. Standard couplings are used at each end of 13-in. pipe casing to house bearings and grease retainers. On one end 7-in. blower case is welded to coupling. Blower wheel, which consists of 4¼-in. hub with 12 blades, is fitted to end of ⅝x20-in. steel shaft. Clearance of 1/16-in. is allowed between blades and blower case. Air supply is fed to blower through ½-in. pipe and controlled by foot throttle connected to quick acting valve. Exhaust is carried from blower by 1½-in. pipe to muffler. Machine is lubricated by two alemite fittings mounted in pipe casing.—From R. K. FOWLER, Job Engineer, Atkinson Kier Co.



TIMBER CUTTING is speeded by use of template developed by contractor for use with Davey pneumatic saw. It makes possible mass production of any cut that can be made with hand saw in fraction of normal time where compressed air is available. Easy to make, template can be fastened to saw or to timbers to be cut.

MULTIPLE ORIFICE LUBRICATOR is recommended by John A. Roebling's Sons Co., of Trenton, N. J., to oil hoisting ropes quickly and effectively. Device consists of split box arrangement made of two small containers, each having series of holes whereby lubricant is fed to each rope of set. Brushes are placed below container to spread lubricant properly. Oil, thin enough to penetrate to rope's center, is poured as rope runs through box. Rope speed and hole sizes should be such that 1 qt. of lubricant is applied to set of six ⅝-in. ropes per 100 ft.

BACKREST (below) adds to comfort of worker drilling rock cliff on Glenn Highway, built by Alaska Road Commission across southern Alaska.

Armco Photo

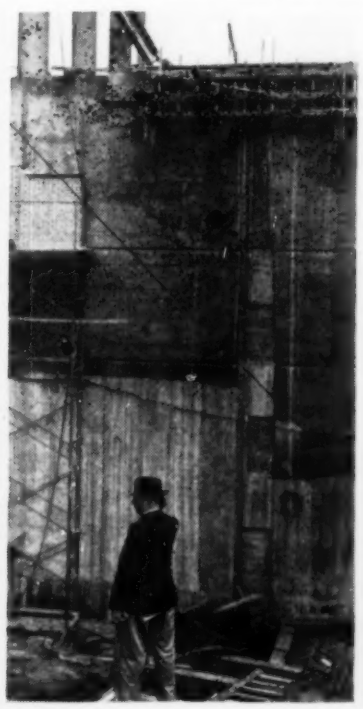
FOUR-YARD CAPACITY TRUCKS are loaded in less than 2 min. with Bauxite ore on operations near Abbeville, Ala., with Athey Mobiloader. Tractor loader has 1½-cu. yd. bucket capacity and uses overhead loading method, digging its load at front and discharging material overhead at rear.

FLOWN ACROSS HIMALAYAS by cargo plane, 2½-ton truck is reassembled somewhere in southwest China. Steel bed of truck was neatly cut in two in India and loaded into C-47 plane, with front wheels followed by rear axle including differential, truck bed, truck body and incidental parts. At destination parts are put together again with bolts and nuts and cut sections are restored by welding.

Lincoln Electric Co. Photo

IMPACT SADDLE WRENCH (below) is used to pull steel shell plates to contour of main frames of ship's hull at Ingalls Shipbuilding Corp., Pascagoula, Miss. Operated by compressed air, it screws up jack bending plates into place for tack welding. Devised by Z. H. SCOTT, shipfitter, it makes possible saving of 1,300 man-hours per ship.

H-BEAM LEADS (below), suspended from bucket-closing line of crane, guide steam hammer as it drives vertical steel sheetpiling for cutoff wall in right abutment of Mill Creek pumping station and barrier dam, Cincinnati, built by LaCrosse Dredging Corp. and Ferd J. Robers Construction Co., contractors for U. S. Engineers (described in "Construction Methods," April, 1944). Lower end of H-beam is seated in ground alongside sheetpiling. Bolted flanges on steam hammer (left) provide guides for operation of hammer on H-section leads. Same leads are used to complete driving of better sheetpiles set and started against temporary timber bracing.



The *Stake* of the United States in Expanding World Trade

WITH the war in Europe racing to a climax, and with a sure pattern for the defeat of Japan already outlined, American business is confronted with the need for an immediate decision on long-term economic policy.

What is this country's foreign trade program to be after the war?

No intelligent appraisal of all the factors any longer can allow us to postpone considering the issue merely because, in the past, foreign trade absorbed barely eight per cent of our production.

Actually, a whole new set of conditions was injected into the picture by the first World War; but we persisted in ignoring these new factors.

Almost overnight, the United States was transformed from the largest debtor nation in the world to the second largest creditor nation. At the same time, we made faster technological progress than any other nation. Thus we created the need for more dollar exchange on the part of the rest of the world and simultaneously made it harder for other nations to earn dollars.

Today, as another, far vaster war is approaching its end, those changed circumstances are magnified. America has new responsibilities—to itself, and to the world.

Our war-inflated industrial capacity cannot be allowed to drop back to prewar levels without causing a domestic crisis which we dare not permit.

And, because so much of the world is geared to the American industrial machine, we can no longer contemplate calmly the repercussions of a largely self-sufficient trade program or of an unplanned foreign trade program. Either would inevitably set the stage for the next world war.

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If we are going to prepare ourselves intelligently to cope with this new problem, we must acknowledge certain basic principles.

World trade cannot be rebuilt simply by attempting to restore *prewar* flows of goods. The war has so completely changed the economic fiber of many countries that it is necessary to develop *new* trade relationships. The East Indies, for example, may find the demand for their rubber considerably reduced; the United States may, to a large extent, have to cease exporting cotton; Japan will need to find new substitutes for much of its exports of silk; the British will need new markets to replace the income which they formerly derived from their large overseas investments.

We cannot expand markets for our goods, at home or abroad, unless we find ways of buying more supplies from more people at home or abroad, so that they will have more dollars to spend.

And we probably cannot create increasing buying power abroad without first exporting more of our technical skills—our engineers, our production and management men—to build new markets for our own specialties.

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What is needed to rebuild the world's economic system?

1. Most basic of all, of course, are stable governments which command popular support. In the absence of strong governments, currency stability cannot be achieved.

2. Most war-stricken countries, for a year or two, will need rehabilitation loans, because they will require far more raw materials, equipment, and live stock than they can pay for out of current production.

3. Loans, however, are only a stop-gap, though often a necessary one. Far more important than rehabilitation loans will be the creation of better opportunities for war-stricken countries to sell to the rest of the world, particularly to the United States, South America, South Africa, and India. The ravages of war do not completely destroy the ability of a country to sell. Indeed, it is surprising what large supplies of certain commodities war-torn countries have on hand even before devastated industries have been restored. The invading troops in Normandy found shoes almost non-existent, but they found food more plentiful than in Britain.

   Better opportunities for war-stricken countries to sell would create opportunities for them to buy the things they will require to restore scattered industries and depleted farms, and would help those countries to get rid of the exchange controls which are now universal. So long as a country is able to expand its exports only slowly and painfully, and is dependent upon foreign loans to prevent the depreciation of its currency, so long will it carefully preserve exchange controls and other restrictions in imports. That is why large advances, either through an International Monetary Fund or an International Investment Bank, can make only limited contribution to the removal of trade restrictions.

4. Permanent monetary and credit arrangements are needed to protect nations against temporary pressure upon their currencies, to permit necessary changes in exchange rates to be made in an orderly manner, and to assure that governments never again will repeat the "beggar-my-neighbor" policies of 1931 and 1932.

5. Finally, the world needs a reversal of the trend toward economic self-sufficiency, which received a strong impetus from the first World War and an even stronger one from the great depression of the Thirties. This does not mean that the efforts of many raw-material producing countries to diversify their industries should be opposed. During the late Nineteenth Century and the first part of

this century, the international specialization of production was carried too far, with the result that many countries became dependent for a large part of their standard of living upon the export of one or two raw materials—coffee, sugar, rubber, silk, wheat, wool, and meat. Between the two World Wars, however, the pendulum swung much too far in the direction of self-sufficiency. Some densely populated industrial countries of Europe (Italy, France, and Germany) even attempted to become self-sufficient in wheat, fats, and sugar. So limited are the natural resources and technical skills of most countries that each one finds many things which it can produce only at prohibitive costs. Between the extreme specialization of the late Nineteenth Century and the more recent trend toward extreme self-sufficiency, a happy medium should be sought.

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What role should the United States play in reconstructing the world's international economic system?

There are those who suggest that the United States be a more or less permanent Santa Claus. They believe that an excess of exports could be financed only by "loans"—loans that would eventually turn into gifts, after producing bitter controversy over why the "debtor" country did not meet its obligations. The persons who assert that full employment can be provided only by an excess of exports are in effect saying that our economy cannot become self-supporting. That is a confession of economic defeatism which a young and vigorous nation should not be willing to make.

The most immediate contribution which the United States can make to world reconstruction is to make itself prosperous.

Prosperity here means a large demand by our industries for imports. The more we import, the easier will it be for foreign countries to meet their large and urgent needs for goods. In 1939, with a gross national product of $100 billion, our imports were $3 billion. After the war, with 55 million people employed and a gross national product of $155 billion, our imports would be about $7 billion or $8 billion.

Not only should the United States make itself prosperous, but it should *keep* itself prosperous. *So important is the United States in the world economy that a depression here is bound to produce a disastrous drop in the price of raw materials throughout the world and to throw most countries into an economic tailspin.*

The United States should support the principle of a large fund to protect the exchanges of the world from temporary pressure. We should not permit differences over the details to prevent its establishment in ample time to be available during the critical period when war-stricken countries will need goods far in excess of their immediate ability to pay for them. *Some* arrangement, even though imperfect in details, will be infinitely superior to no arrangement.

Finally, the United States should take the lead in breaking down barriers to trade. We are the logical country to do this, partly because of our immense domestic market, and partly because for most of the last twenty-five years this country has been able to sell other countries more goods than they have been able to sell to us. One of the greatest contributions which the United States could make to a sound and expanding world economy would be to bring our imports, as soon as practicable, up to our exports. *In other words, the United States, in the long run, should be hard to borrow from but easy to sell to.* The United State. should implement this policy (1) by continuing the negotiation of reciprocal reductions in duty, and (2) by accepting exchange rates which make foreign currencies cheaper in dollars than they were in 1939. So great will be the world's need for goods that we can be sure that any dollar exchange earned by sales to us will be converted into American-made goods and will lead to larger exports.

Time was when the United States obtained about eight per cent of its standard of living by sending goods abroad and bringing back other goods. Before the war, however, we were getting less than five per cent of our living by international trade. If, after the war, we were gradually to raise the proportion of our standard of living obtained by trading with other countries to ten per cent of domestic production, our imports would be about $15 billion or $16 billion a year. Our people would be able to buy many things which they now cannot afford, and scores of countries which export raw materials and luxury products would feel the stimulus of rapidly expanding markets. Their expanded demand for road building machinery, mining machinery, machine tools, agricultural implements, locomotives, railroad cars, electrical equipment, trucks, automobiles, and a multitude of products of our factories would create a million or more additional jobs in our factories.

Although the United States would raise its standard of living by increasing its imports and its exports, it should honestly face the fact that the resulting shifts in production and employment would temporarily be painful for some people. The increase in imports would be in commodities which other countries can produce for less than the cost at which much of our output is produced—such as sugar, wool, copper, some fats and oils, wines, winter vegetables and fruits. The increase in our exports would come from those industries in which our superiority is greatest—particularly the manufacturing industries. Finally it would be advantageous, to the country as a whole, to shift a million or two workers from agriculture, where they earn about 60 cents an hour at best, to manufacturing, where they earn better than 80 cents an hour.

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The very fact that in economic matters the rest of the world is dependent upon the United States, exposes our country to great demands and to envy and misunderstanding. The United States must be willing to help the rest of the world, but its help should take the form of assisting other countries to help themselves. Never in all history has one country had such an opportunity to give the world a rising standard of living, to foster conditions under which peace flourishes. What greater tragedy could there be than to make the sacrifices which we are now making and fail to seize this chance to create a world of hope and opportunity in which the spirit of goodwill among nations is able to flourish.

President McGraw-Hill Publishing Company, Inc.

HOLING THROUGH of 13.1-mi. Alva B. Adams Tunnel through Continental Divide in northern Colorado is completed June 10 under direction of E. R. STUVER (left), resident engineer, and C. H. HOWELL, project engineer, U. S. Bureau of Reclamation in charge of Colorado-Big Thompson project. Contractrs for final sections of 10-ft. bore were Stiers Bros. of St. Louis, Mo., and S. S. Magoffin Co., Englewood, Calif.

Present and Accounted For...

ENGINEERING STAFF of Metropolitan Water District of Southern California, which completed Colorado River aqueduct, includes (left to right): JAMES M. GAYLORD, chief electrical engineer; JULIAN HINDS, general manager and chief engineer; R. B. DIEMER, chief operation and maintenance engineer; and R. A. SKINNER, office engineer.

FIFTIETH ANNIVERSARY in service of city of Mount Vernon, N. Y., is celebrated this year by CHARLES M. HICK, city engineer. Starting as member of field party in 1894, he has been city engineer since 1906.

NAMED VICE PRESIDENT of Turner Construction Co., New York City building contractors, is GEORGE F. FERRIS, who has been associated with this company since 1929. He has just returned from Honolulu where he served as chairman of PNAB Contractors in construction of naval fleet and air bases at Pearl Harbor, Midway, Wake, Guam, Manila and other points in Pacific.

NEW PRESIDENT of Illinois Contractors Association, Inc., is C. J. MORITZ, president, C. J. Moritz, Inc., Effingham, Ill. He has been a highway contractor in Illinois for 20 yr. and before that his firm operated in Wisconsin.

NEW PRESIDENT of Southern California Chapter, Associated General Contractors, is E. S. McKITTRICK (left), of Los Angeles. He is head of E. S. McKittrick Co., general contractor, specializing in construction of industrial plants and buildings.

NEWLY ELECTED PRESIDENT of Intermountain Chapter, Associated General Contractors of America, is CLARENCE WATERFALL (right), of Ogden, Utah. Owner of Clarence Waterfall Co., contractor, he also operates large ready-mix concrete and sand and gravel company.

A PAGE OF PERSONALITIES

LEGION OF MERIT is awarded to COL. FISHER S. BLINN, Corps of Engineers, U. S. Army, of Marion, Ind., for outstanding service as resident engineer and commander of troops on Amchitka.

MERITORIOUS CIVILIAN SERVICE AWARD is presented to Southeastern Construction Co. of Charlotte, N. C., for work done for Navy Department at Charleston, S. C. At ceremony are (left to right): JOHN E. STURDIVANT, personnel manager; RALPH COCHRANE, electrical superintendent; CAPTAIN E. C. SEIBERT, public works officer at Charleston Navy Yard; LIEUT. COMDR. W. F. WEAVER, contract superintendent at Navy Yard; T. M. SEWELL, company vice president; M. J. BENNETT, concrete design superintendent; RALPH H. HUSBAND, estimator; and JOHN W. WHITTON, assistant secretary.

NEW GOVERNOR of Panama Canal Zone is BRIG. GENERAL JOSEPH C. MEHAFFEY, whose first duty in the Canal Zone was from November, 1911, to June, 1912. He returned in 1929 as assistant maintenance engineer, remaining until 1933.

Signal Corps Photo

SOUTHWEST DIVISION of Asphalt Institute has appointed A. J. KAVANAUGH as district engineer for Oklahoma and New Mexico, with office at Oklahoma City. He has engaged in designing and construction work in Oklahoma for 13 yr. and for last 6 yr. has been secretary-manager of Oklahoma Good Roads Association.

HEAD OF SUPPLY DIVISION of Seattle District, U. S. Army Engineers is LIEUT. COL. ERNEST J. RILEY, recently promoted. Among his duties is supply for Alaska military construction.

NEW VICE PRESIDENT of Associated General Contractors of Iowa is ERICK W. LIPPERT (left), of Boone.

ELECTED PRESIDENT of Associated General Contractors of Missouri is E. C. ATKINSON (right) of St. Joseph, vice president of C. H. Atkinson Paving Co. His firm has built highways, airports and bridges, principally concrete slab work, since 1924.

LEGAL ADVENTURES of TRACTOR CONN

By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

The Case of the Inquiring Subscriber

Letter to Construction Methods from a North Carolina contractor:

"In 'The Case of the Disputed Shipment' (May issue), it is indicated that Tractor Conn could refuse an entire shipment if he found any part of it not up to grade. What is his position if he wants to accept the part that does come up to the specifications and return the parts he considers no good? This might work if he had a price for each item, but what happens if he and the shipper cannot agree on the value of the part he does accept if he can accept part of the original order?"

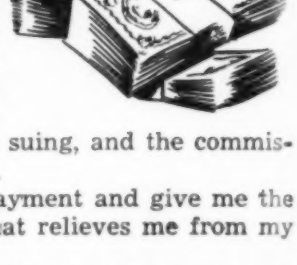
Reply from Leslie Jobb:

"In this case, if the buyer can easily duplicate the order elsewhere, his safest plan is to reject the whole shipment, as he has a right to do. If he cannot do that and is still not willing to accept the inferior goods, his best plan might be to accept and pay for the acceptable part, reject the inferior and tell the seller to sue for damages. If and when the seller sues, he can sue only for the price of the rejected goods and the buyer may defend on the ground that they did not comply with the specifications.

"It seems to me that the case you mention of buyer and seller being unable to agree on the respective values of the accepted and rejected parts could hardly arise. If he buys 1,000 bags of cement, they would surely be sold at so much per bag. If he buys cement, field drills and dynamos in one order, surely they would be priced separately. In that case, it would be a mere matter of arithmetic to arrive at the value of accepted and rejected parts.

"Assume, however, that he orders a carload of assorted supplies of different kind with no particular price on any item and agrees to pay a specified sum for the entire carload. Then he would be safer to reject the whole carload, but if he must have the items which come up to the specifications, his best plan would be to take what he wants, reject the inferior part and, if cannot agree with the seller on the value, let him sue for the full amount and allow the Court to fix the fair market value of the accepted items. If he buys a carload of a single item—for example, cement—and one-third of the bags are defective, he can accept the remaining two-thirds, pay the seller two-thirds of the total price, and let him take the laboring oar for the balance."

The Case of the Lucky Endorser



"Albert Benson will lend me $300, if you'll endorse my note," the borrower pointed out. Tractor Conn, after the proper amount of urging, put his name on the back of the note, which Benson later transferred to a local bank. The bank failed and the state bank commissioner took charge of its assets. In due time the Benson note fell due, the borrower was not worth suing, and the commissioner demanded payment from Conn.

"You didn't present the note for payment and give me the usual notice," Conn pointed out. "That relieves me from my liability as endorser."

"It might have if the bank hadn't failed, but the usual rule about notifying the endorser does not apply to a state official who is in charge of the assets of an insolvent bank," the commissioner argued.

The Oklahoma Supreme Court, however, ruled in Tractor Conn's favor in the case of State vs Rutland, 250 Pacific Reporter, 914.

"We do not understand that the bank commissioner is relieved from meeting the requirements of the law in relation to the collection of paper payable to a failed bank," the Court said.

The Case of the Undelivered Torches

Tractor Conn was ordering a new make of cutting torch from a new salesman.

"This is a fast selling make and our plant is working to capacity. I'm afraid you'll have to take delivery whenever we're ready," the salesman stipulated.

"That's O.K. by me," Conn agreed. Time passed on, with neither party saying anything to the other. When Conn's torches were ready to ship the same salesman sold them elsewhere and Conn claimed damages for breach of contract.

"We're not mind readers and you never notified us that you were ready to take delivery," the manufacturer pointed out.

"And neither am I," Conn retorted, "and you never notified me the torches were ready to ship."

"It would thus become the duty of the manufacturer to notify Conn and give him an opportunity to inspect the torches and determine whether they corresponded to the contract. If so, it then became Conn's duty to take and pay therefor," said the New York Court of Appeals in ruling in Tractor Conn's favor, in the case of Bliss Co. vs. U. S. Incandescent Co., reported in 149 N. Y. 300, and there is a Pennsylvania decision to the same effect.

More Legal Adventures of Tractor Conn Next Month

Special Tackle

INSTALLS

72½-TON MOTOR

IN TANKER

A SPREADER of welded steel members, suspended between the booms of two 50-ton cranes, was the tackle employed at the Sausalito, Calif., shipyards of Marinship Corp. for installing in the hull of a steel tanker one of the largest ship propulsion motors ever built. Manufactured by The General Electric Co. at Schenectady, N. Y., the huge motor, rated at 10,000 hp. and weighing 145,000 lb., is more than 17 ft. in diameter. Its rotor and stator frame were shipped separately by rail to San Francisco where they were assembled on a trailer truck and taken over the Golden Gate Bridge to the Marinship yard.

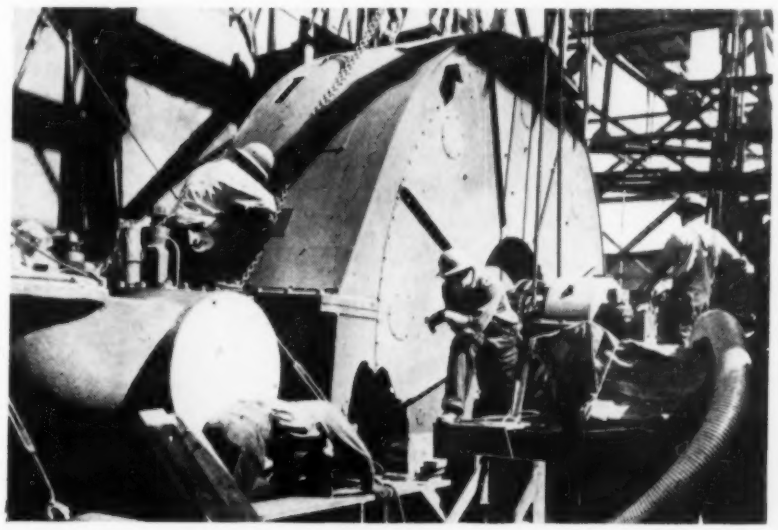
Ordinarily motors this large are installed by first securing the stator frame in the hull and then threading the rotor into it. By preassembling the big motor and handling it as a unit, Marinship saved several day's time in having the tanker ready for service.

SPREADER is lowered by pair of 50-ton cranes preparatory to picking up 72½-ton motor for installation in ship's hull.

SWINGING IN MID-AIR from spreader between crane booms (below), 10,000-hp. motor is on its way to be installed in hull of tanker.

CONSTRUCTION FOR WAR

HANDLED AS UNIT (below) big ship propulsion motor is set in place in hull of tanker.



EMPTY SHOW ROOMS

mean your Cletrac Dealer is on the job

CLETRAC REPORTS ON ITS WAR EFFORT

This folder, recently published, tells briefly of Cletrac's part in the war effort. A copy will be mailed on request.

CLETRAC
REPORTS ON ITS WAR EFFORT

GASOLINE • DIESEL

CLETRAC

THE show room of your Cletrac distributor is probably empty of new machines. This merely means he is right on the job today in his service department—busier and doing more work than he once thought possible.

Plagued with shortages of men and material, loaded with more demands for service than ever before, he is still doing the impossible, day after day, in helping to keep present tractor equipment in working condition.

In these efforts he is not only making a full contribution to the war by saving time and money for Cletrac owners, but also helping to conserve equipment needed to carry on the jobs of the home front. The big task today is to keep your present equipment running.

There is a limited number of new Cletracs available. These tractors are not in your dealer's showroom but subject to government release. Your Cletrac dealer will gladly assist you in making application for a new Cletrac if you can qualify as an essential user.

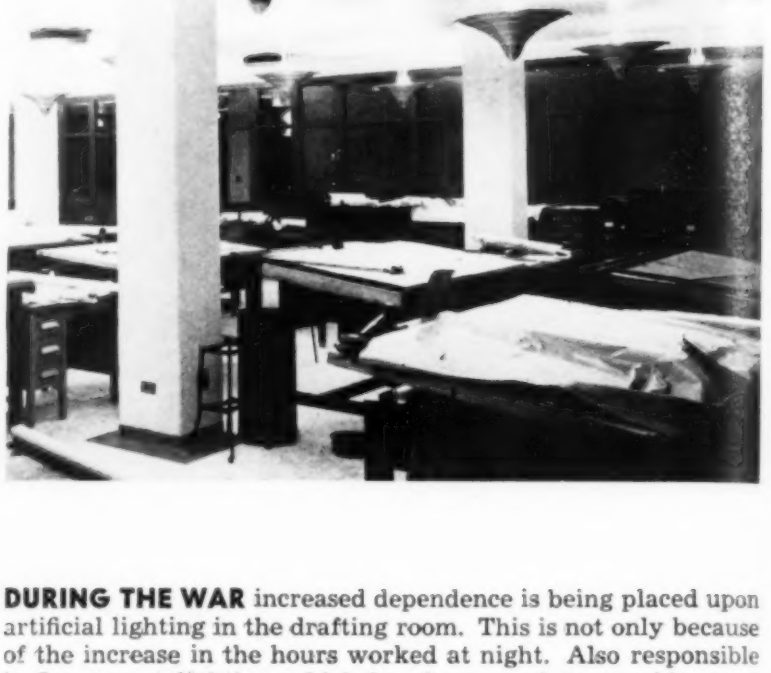
THE CLEVELAND TRACTOR COMPANY • CLEVELAND 17, OHIO

Tru-Traction **TRACTORS**

ARMY (E) NAVY

Fig. 1 . . . INDIRECT LIGHTING SYSTEM (below) in this drafting room provides large-area low-brightness through use of tungsten filament lamps.

Fig. 2 . . . CONVENTIONAL INDIRECT SYSTEM (below) utilizes tungsten filament and mercury lamps in conjunction with matte white ceiling.



Better Lighting

For Drafting Rooms

By W. G. DARLEY
Nela Park Engineering Division,
Lamp Department, General Electric Co.

DURING THE WAR increased dependence is being placed upon artificial lighting in the drafting room. This is not only because of the increase in the hours worked at night. Also responsible is fluorescent lighting which has been used to provide great numbers of drafting rooms with sufficiently improved seeing conditions to prove to draftsmen that artificial lighting does have a place in this field. As a result, more light and better lighting than ever before are being used in drafting rooms. In 1936, the lighting recomendation for drafting was 30 to 50 foot-candles. The recommendation today is for 50 foot-candles or more. It is indicated that for many common drafting room tasks 100 foot-candles or more are really necessary for true seeing ease.

Until relatively recently the sources most commonly used for the lighting of drafting rooms—the Mazda C (tungsten filament) lamps and the Mazda H (mercury) lamps—were concentrated light sources of high brightness. Since the most

Fig. 3 . . . BEAMS PROVIDE SHIELDING of eyes from brightness of large ceiling area. Concentric luminaire for silvered bowl lamp was especially designed to provide higher utilization of light flux reflected by ceiling.

Fig. 4 . . . "COOLNESS TO EYE" results from special metal ceiling which directs most of light downward. Aluminum-finished surface has ridges of special contour.

practical solution for drafting room lighting problems has called for large-area, low-brightness general lighting systems, one of the most common methods used has been that employing conventional indirect luminaires in conjunction with a matte white ceiling (*Figs. 1 and 2*).

"Hot" and "Cool" Lighting

While the cost of the lighting, as a rule, is a relatively small sum when compared to the overall cost of operating the drafting room, objections have been raised to higher foot-candles with conventional indirect lighting for other reasons. One of these reasons is the complex psycho physiological reaction which causes us to brand an installation as "too hot." While data indicate that the actual heating effect of artificial lighting is not great, one can scarcely over emphasize the importance of the psychological reaction. For instance, one has often experienced the sensation of heat in interiors lighted with artificial illuminants—even may have burned his fingers changing lamps—and therefore may expect artificial lighting to be warm. Heat is associated with the warm color of light from tungsten filament and naturally the more light and the larger the area of brightness, the hotter it seems.

Lighting practice has taken these factors into account in recent installations. For instance, beamed ceilings reduce the brightness of the overhead in the normal field of view (*Fig. 3*). An advantage of the lighting provided by the use of mercury lamps (*Fig. 2*) was that it was psychologically cooler.

One of the most interesting approaches toward overcoming the undesirable psychological sensation of heat from too high a brightness in the field of view was the development of a metal ceiling with an aluminum-finished surface having ridges of a special contour. This ceiling reflects the light rays in such a manner that a large percentage of them is directed downward so that light rays near the horizontal are minimized. As a result, the brightness of this ceiling, when viewed from a distance, appears much less than that of the usual matte white ceiling receiving the same light flux (*Fig. 4*). Thus, for the same number of foot-candles on the work plane, the sensation of brightness overhead is materially reduced; the color of the ceiling changes from the warm white obtained with a flat white ceiling to a neutral gray. The result is that the psychological reaction is decidedly on the cool side.

Fluorescent Lighting—With the advent of the Mazda F (fluorescent) lamps, it was natural that they should be applied in the drafting room in the same fashion which had proved so satisfactory with former sources, that is, in indirect luminaires

Fig. 5 . . . FLUORESCENT LAMPS (below) in indirect equipment light drafting room. Each trough accommodates two continuous rows of 100-watt lamps.

(*Fig. 5*). However, the F lamp differs radically from the C and H lamps in that, instead of being concentrated and having a high brightness, it is extended and has a relatively low brightness. For the majority of drafting-room uses the brightness of the 1½-in. dia. cross-section F lamps, such as the 40-watt size, is judged to be tolerable from the standpoint of reflected glare if foot-candles are high enough (50 foot-candles and up) and the lamps are spread out over the ceiling. At the same time, the brightness of this lamp is higher than one would care to tolerate in the normal line of vision for prolonged periods. We find, therefore, that good lighting results can be obtained in the drafting room with the lamps employed in direct lighting equipment which permit the lamps to be "seen by the work," but protect the eyes of the draftsmen from the lamp brightness at normal viewing angles.

One such method of installing the lamps is to put them in continuous troughs with glass over the bottom (*Fig. 6*); an-

Fig. 6 . . . CONTINUOUS ROWS of F lamps on 2-ft. centers in large-area semi-specular reflectors glazed with lightly diffusing glass provide illumination of more than 50 foot-candles.

Fig. 7 . . . SINGLE ROWS of 40-watt F lamps in continuous rows of open-bottom, louvered, white finished troffers on 3-ft. centers light this large room to more than 50 foot-candles.

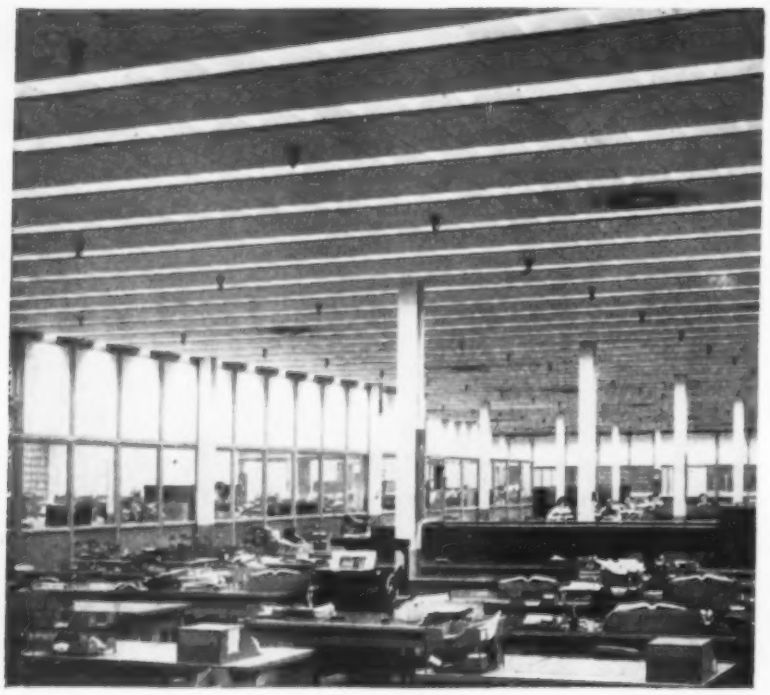


Fig. 8 . . . HIGH DEGREE OF VISUAL COMFORT is supplied by this installation (left) of continuous rows of open-bottom, louvered, aluminum finished troffers on 4-ft. centers accommodating 40-watt F lamps.

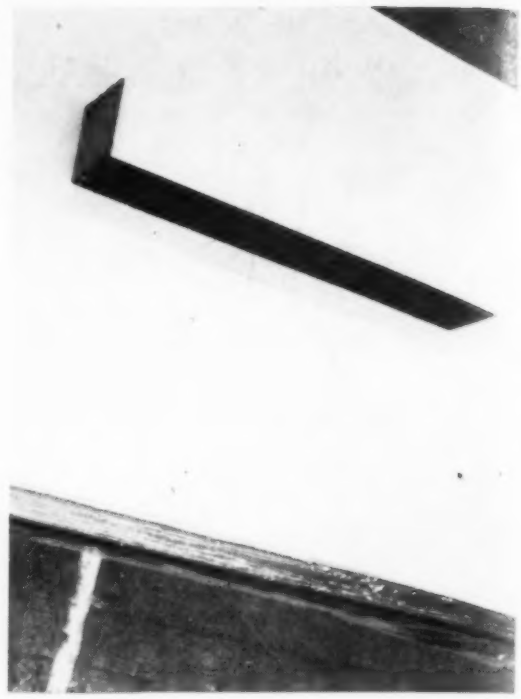


Fig. 9 . . . ANNOYING SHADOWS (right) may result when straightedge is parallel to line of lamps.

other, to put them in open-bottom, louvered continuous troughs or "troffers" (*Figs. 7 and 8*).

Shadows Can Be Minimized—Where drafting boards are used in the horizontal position, the shadows of straightedges when parallel to lines of lamps may be annoying (*Fig. 9*). The annoying sharpness of the shadows can be minimized by locating the lamps at an angle with the straightedge casting the shadow or vice versa. In this way it is possible to obtain a diffusion of the shadow comparable to the degree of diffusion obtained with indirect lighting (*Fig. 10*).

In general, the desirable feathering out of the shadow edge begins to be noticeable when the axes of the straightedge and lamps reach of the order of a 15-deg. divergence. Observation indicates that with lamps in louvered troffers best overall results are obtained when the boards are rotated counter-clockwise with respect to the troffers or the troffers clockwise with respect to the boards. The exact angle of rotation is not established; however, 5 deg. is often suggested for structural or esthetic reasons. While this angle will result in shadows on the board from triangles, etc., at the 45 deg. angle, this ordinarily represents but a small fraction of the draftsman's work.

Vertical vs. Horizontal Position—It is interesting to note that where pencil drawings are used the visibility of the work

(Continued on page 150)

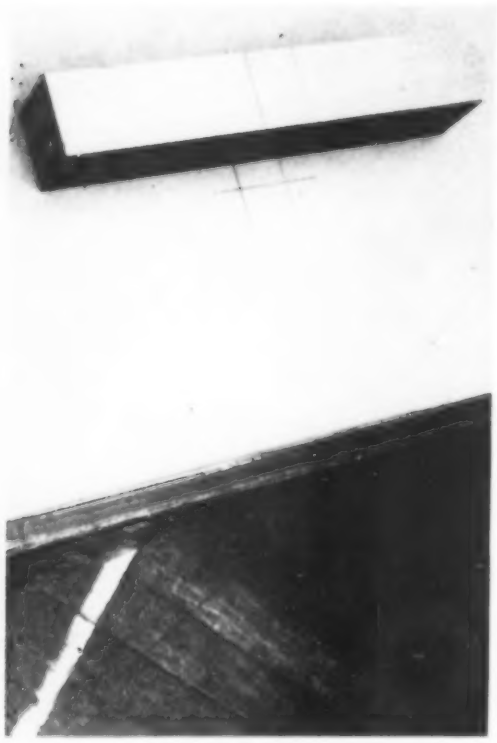
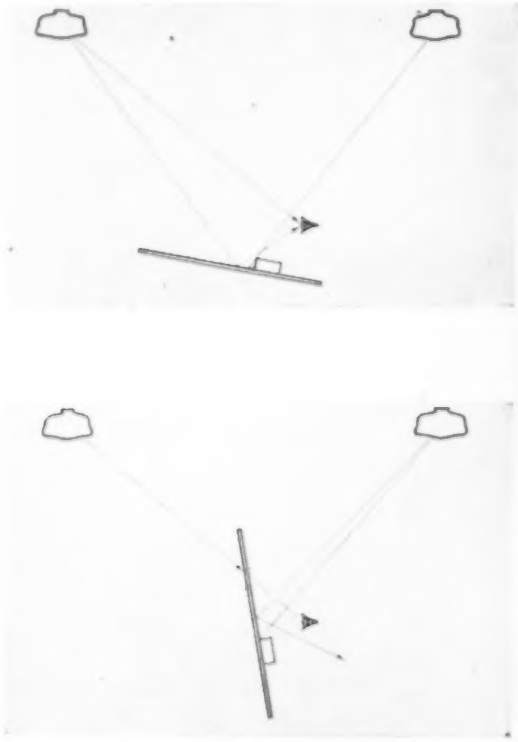


Fig. 10 . . . SHARPNESS OF SHADOW from troffer system is minimized by locating straightedge at angle of 45 deg. with axis of lamps.

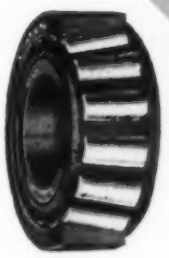


Figs. 11 & 12 . . . DIRECT GLARE, reflected glare and shadows cause poorer visibility when drawing board is in horizontal position (left) than when it is vertical (right).

Fig. 13 . . . VERTICAL BOARD can be easily tilted, raised and lowered. Note trough at bottom of board for drawing materials.

Barber-Greene B-G Asphalt Plant equipped with Timken Bearings.

TIMKEN BEARINGS
Help Make Nests For Army War Birds



The United States Army is prepared to construct safe landing fields for its fighting planes anywhere at any time; in any emergency; at short notice.

Among the equipment used by the Corps of Engineers in the construction of temporary and permanent airports are Barber-Greene Asphalt Plants similar to the one shown in the photograph.

These mobile plants work for long continuous periods in combat areas, frequently building complete all-weather runways in five or six days. This gruelling service calls for exceptional quality and endurance in every part — including bearings.

That's why Timken Tapered Roller Bearings are used at important positions in both the Mixer and Dual Drum Dryer; they help assure maximum operating speed; simplify lubrication; increase dependability and endurance; and reduce maintenance.

As in industrial and military equipment of all kinds, they do this by eliminating friction; carrying radial, thrust and combined loads; and holding moving parts in correct and constant alignment. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

4400 hours

THIS tire, an 18.00-24 20-ply, has turned in a service record of 4400 hours in a strip mine operation. It is still good for many, many more hours. Tires like this in strip mine service used to wear out in 2000 to 2500 hours.

This tire is a B. F. Goodrich Universal. It has extra protection against bruise and impact breaks because of a special construction. Under the tread there are four cord breakers insulated with thick layers of special shock-resisting rubber. Under impact the cords stretch and return to their original position, distributing the force of the blow and allowing it to be absorbed by the rubber between them. Thus the shock passed on to the cord body of the tire is greatly reduced. The close-spaced tread design gives still further protection. These things provide far greater resistance to bruising and to ply separation—longer tire life on the hardest jobs.

Bruise resistance is only one of the many advantages of the Universal Tire. The tread is non-directional, with equally good traction forwards or backwards.

Rocks cannot easily cut or snag the tread because there are fewer sharp edges and corners. And special tread compounds are used to further resist cutting. The angular grooves of the tread design prevent side slippage.

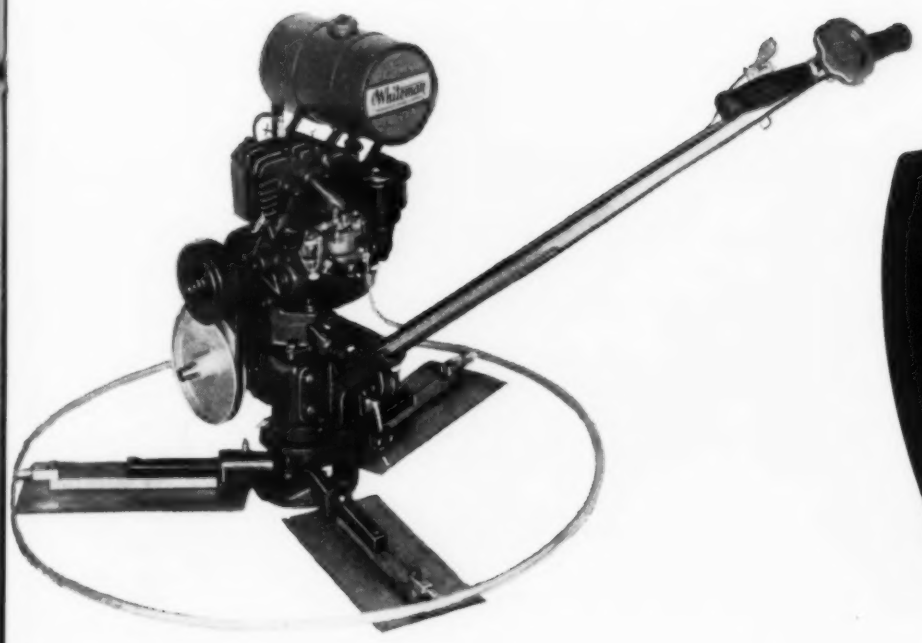
Because of such special B. F. Goodrich features the Universal and other tires in the off-the-road line are today giving exceptional service on all types of jobs. Supplies of all truck tires are now strictly limited, so it is well to place tentative orders early. The B. F. Goodrich Co., Akron, Ohio.

B.F. Goodrich
Truck & Bus Tires

SUCCESS STORY....

Making Good—and How!

HUNDREDS IN USE TODAY



THE NEW REVOLUTIONARY LIGHTWEIGHT MODEL "J"

WHITEMAN

CONCRETE FINISHING MACHINE

MODEL "J"

FOR ALL TYPES OF SMALL JOBS—

SUCH AS HOUSING PROJECTS

Only out a few months — but hundreds are floating and finishing on small jobs all over the country!

Gives the SMALL CONTRACTOR the BIG operator's economies of machine methods.

Designed specifically for small or congested areas (34" diameter trowel).

Even an inexperienced man can cover 1,000 sq. ft. in 15 minutes . . . experienced operators do far better!

Weighs only 105 lb. Easily carried. Gets earlier start on floating operations.

Low cost. A profit-producing investment from the start! Everyone can afford it. One of the earliest buyers bought 6 more after 3 weeks use.

★ *Write or wire for nearest Distributor*

Whiteman MANUFACTURING CO.

249 Casitas Avenue — Los Angeles 26, California

Clamp – Splice – Tie –
Repair – Mend – Reinforce
with
PUNCH-LOK
Streamlined
BANDING METHOD

In all types of industry—production, maintenance or service—Punch-Lok Banding Method is at work . . . connecting hose, stopping leaks in steam or water lines, splicing electric cable, reinforcing and mending splits in cross-arms, poles and ladder rails, tieing rigid conduit or flexible cable to pipe lines or girders, seizing ends of wire or manila rope to prevent fraying . . . in short, wherever a banding method can be used to connect, mend, splice or reinforce. Open end bands available for use when ends of work are obstructed. There are places in your industry where Punch-Lok Clamps would save you time and money.

CLAMPS . . . Made of flat, high tensile galvanized steel or of Everdur, which is a corrosion resistant copper base alloy. All clamps are double wrapped. Available from ¾" to 48" I.D. Any larger size clamp can be pulled down to fit any smaller diameter.

LOKING TOOL . . . Sturdily constructed to assure long life. Locks all size clamps with a sufficient tensional pull.

GROOVED FITTINGS . . . For hose lines—air, water, steam or any other fluids. Permits application of high pressure clamping without damage to hose.

★ Write for Descriptive Catalog and Name of Local Distributor

PUNCH-LOK COMPANY

Dept. Q, 321 N. Justine St.
Chicago 7, Illinois

CONSTRUCTION EQUIPMENT NEWS

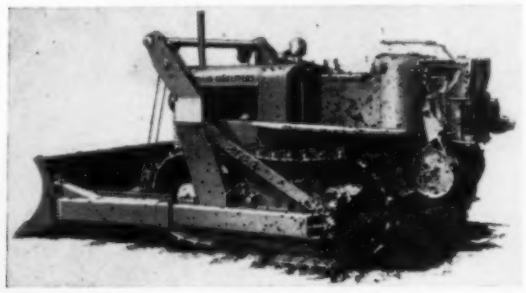
SEPTEMBER, 1944 REVIEW of Construction Machinery and Materials

ELECTRODE HOLDER. made in two models, one a 19-oz. unit built to handle heavy 300-500-amp. work and the other a 6¼-oz. holder for lighter 200-amp. jobs, is molded of high-heat plastic to insure full insulation and to eliminate completely

all possibility of arcing caused by slag, moisture or contact with grounded surfaces. It consists of three main parts, handle, cable connector and tip, is designed for either mechanical or solder cable connections, permits quick change and allows burning of electrodes to within ½ in. of holder tip. Left-hand threading in tip and handle connection securely grips electrodes and prevents slipping.—**Allison Tool & Engineering Co., 4031 Whittier Blvd., Los Angeles, 23, Calif.**

★ ★ ★

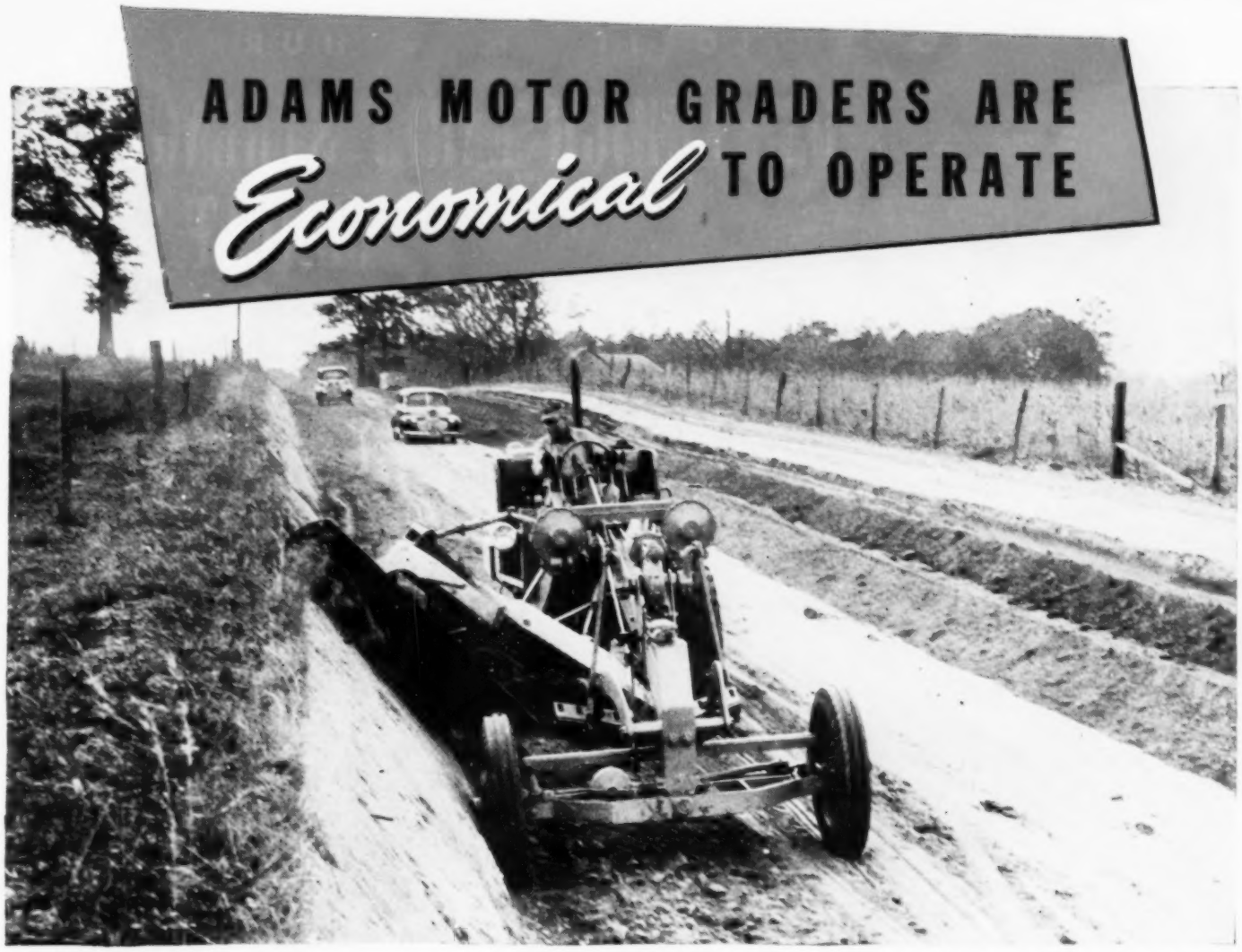
CABLE-CONTROLLED, SIDE-LIFT BULLDOZER AND TRAIL-BUILDER features single king-pin mounting of moldboard and double trunnion tilting. Moldboard may be angled to right or left on the king pin by removing two landslide pins, swinging the blade to the desired side and replacing pins to hold it in place. Double trunnion mounting makes it possible to tilt either end of the blade 12 in. by attaching one push arm to the top trunnion on one side, while the other arm is mounted on the lower trunnion on the opposite side. Horn and push frame are fabricated from heavy steel welded box-beams to provide maximum strength. Blade is reinforced with welded V-shaped vertical braces and heavy steel plate horizontal cross-pieces. Moldboard is fitted with reversible cutting edge and replaceable corner bits. Dozer is track-mounted with weight evenly distributed over crawler shoes to provide maximum traction. Single- or double-drum Buckeye power control units provide necessary power.—**The Buckeye Traction Ditcher Co., Findlay, Ohio.**



★ ★ ★

DOUBLE-HEADED RATCHET WRENCH permits each side of head to be used instantly in either direction, with each head having two different sizes of openings, to accommodate nuts. Three sizes of handles, each one used with a number of interchangeable heads. Fits hex or square nuts of all standard U. S. bolts up to 1½ in. Features: (1) Sturdy—claimed to

withstand any pull without breaking handle, head or pawl; (2) speedy—instantly reversible by turning pawl—works right-hand or left-hand without being removed from nut; (3) safe—cannot slip off nut and cause skinned knuckles or other injury to user; (4) simple—single retaining screw permits quick changing of head—cannot be reassembled incorrectly; (5) serviceable—opening in head enables wrench to be used over long studs—ratchet permits operation in narrow spaces and close quarters—socket form of head protects nuts from being marred or chewed up.—**Greene, Tweed & Co., Bronx Blvd. at 238th St., New York 66, N. Y.**



One of a series of ads on Adams motor grader features

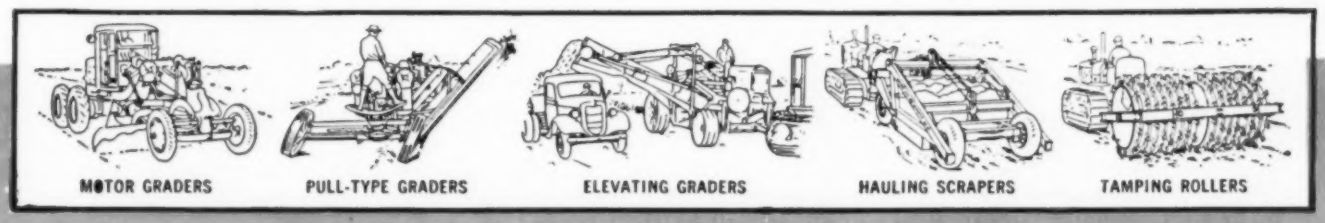
ECONOMICAL motor grader operation involves two considerations—(1) daily operating cost and (2) the machine's ability to stand up under hard usage without excessive repairs. On both considerations Adams are tops.

As to fuel consumption, there are plenty of Adams heavy-duty motor graders doing hard work today on two gallons or less of low-priced Diesel fuel per hour . . . As to maintenance, Adams machines, with their strong, all-welded and machine-finished construction, seldom need repairs; use the adjustments for wear and they will run for many months without repair parts. The International Diesel engines used have enviable records for economy and when repairs are needed, parts and service are readily obtainable anywhere at fair prices.

Add to this economy of operation their ability to adapt themselves to a wide variety of work, their abundance of power and their ease of operation and you have in Adams motor graders all of the qualities you are looking for. Plan now to standardize on Adams and ask your local Adams distributor for further details.

J. D. ADAMS COMPANY ◦ INDIANAPOLIS, IND.

At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.



ADAMS ☆ ROAD-BUILDING AND ☆ EARTH-MOVING EQUIPMENT

TO BUILD IT IN A HURRY...

USE LEHIGH EARLY STRENGTH CEMENT !

Normally it would have taken 21 days to strip forms from this vital war plant. Lehigh Early Strength did it in 5.

In the job shown at right, the use of Lehigh Early Strength in 3 upper floors saved (1) the purchase of 13,000 sq. ft. of plywood panel forms; (2) 5 days construction time on each floor; (3) 5 days heat protection on each floor during cold weather.

Faced with cold weather and slow-down of construction on this bridge, the contractor used Lehigh Early Strength. The result was quicker completion plus a saving on form costs through prompt removal and re-use.

During the last few years time was at a premium . . . and construction had to be done *quickly*. During these critical times Lehigh Early Strength Cement demonstrated that . . . it builds fast; it builds well.

Lehigh Early Strength makes a finer, denser concrete in ⅓ to ⅕ normal curing time. It takes only one or two days for Lehigh Early Strength to equal the strength that normal cement acquires in seven days.

So if you want to save *time* as well as expenses . . . do as so many wartime builders have done . . . use Lehigh Early Strength Cement. Let the Lehigh Service Department help you solve your individual problems.

Lehigh CEMENT

Use **LEHIGH EARLY STRENGTH CEMENT** for service strength in a hurry.

LEHIGH PORTLAND CEMENT COMPANY • ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

P & H

MAKE WAR ON WEAR WITH PROPER CARE

CUSHIONED POWER

With Hydraulic Control

Smoothness in a shovel means far more than easy operation. It means protection against shock for clutches, brakes, gearing and all operating mechanism. It means steadier and more dependable operation — less maintenance and upkeep — longer machine life.

Naturally, the approved automotive type hydraulic control used on P&H Excavators results in less operator fatigue, greater speed, and increased hourly production.

Every shovel user should know the whole story about P&H's Hydraulic Control. It is available to you in the form of a new bulletin. Your copy will be sent on request.

Write today for your copy of "Advantages of 'Direct Acting' Hydraulic Control." Ask for Bulletin X-85. A post card will bring it.

P&H Excavators have reduced maintenance to a minimum with such other outstanding advantages as *true tractor type crawlers, all welded construction of rolled alloy steels,* etc.

Gen. Off.: 4494 W. National Ave., Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

HEIL

Hydraulic Bulldozers and Trailbuilders

(designed to work with Cletrac Tractors)

give you more speed, greater flexibility – and handle the tough jobs easily

You get more speed because the unit is lighter and stronger due to the replacement of heavy members with welded box sections. These units give you greater flexibility and maneuverability for two reasons. (1) You get full visibility for safe, efficient handling. (2) You get instant response to a touch on the quick-acting controls.

Heil Bulldozers and Trailbuilders have the power, rugged strength, and sound engineering design that enable you to move through the tough spots with ease. Most owners agree, "For full loads and more yardage at lower cost, use Heil quality Earth-moving equipment."

Write for bulletins. R-36

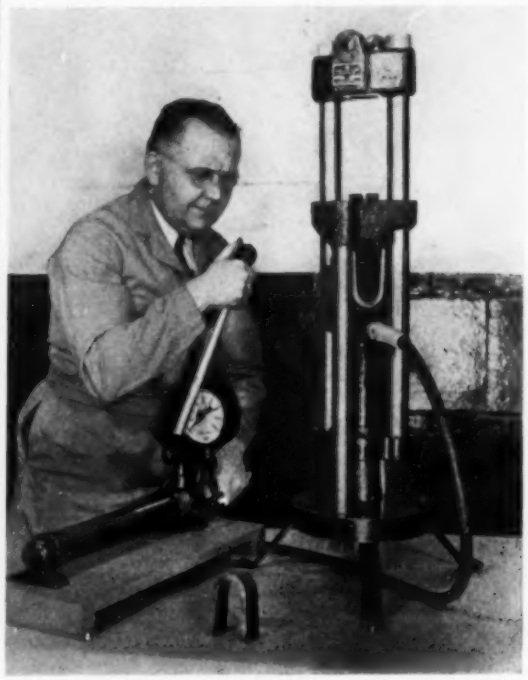
SEE YOUR CLETRAC TRACTOR DISTRIBUTOR

ARMY NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

PORTABLE WELD TESTING MACHINE performs these three weld tests: (1) Reduced section transverse tension test; (2) guided bend test—a complete 180-deg. face or root bend; (3) longitudinal all-weld-metal tension test (0.505 in.) Advantages: (1) Ability to provide accurate data on tensile strength and ducility of weld specimens, as determined by the three tests; (2) relatively light weight which enables users to perform weld tests on the job.



Latter feature makes the machine particularly useful for firms doing extensive field work such as pipe-line installations, construction and similar jobs performed in remote locations. Machine operates on principle of hydraulic jack. Hand operated pump transmits pressure through hose to plunger. While maximum direct load is 40,000 lb., use of reduced section specimens permits tests on metals of 150,000 psi. or higher tensile strength. Jaws for making transverse tension test and plunger and die for the guided bend test are supplied with machine. Jaws for the longitudinal all-weld-metal tension test are furnished on special order. Installed in oak cabinet with handles at either end to facilitate carrying.—**Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.**

★ ★ ★

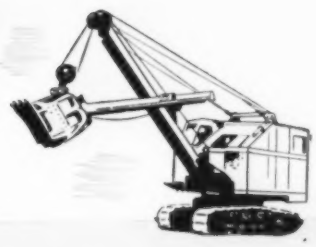
PIPE REAMER of extra long taper design is claimed not only to avoid flaring, splitting or reducing wall of pipe, but also to do a clean and easy job of

cutting burr from inside pipe or conduit. Furnished with ratchet handle or can be used with ratchet handle of Ridgid No. 00R ratchet threader.—**The Ridge Tool Co., Elyria, Ohio.**

No detail escapes the attention of Wellman's technical men. Here an engineer is studying photomicrographs to learn more about friction surfaces.

YOUR FRICTION PROBLEMS

are mighty important to us



Simple though it may seem, the friction in your clutches and brakes is extremely complex . . . influenced by pressure, temperature, velocity and many other factors. That's why The S. K. Wellman Company maintains a large and well equipped laboratory to study *your* friction problems.

From such research and experimentation have come many developments that result in smoother performing, longer lasting Velvetouch all-metal friction materials. Specify Velvetouch replacement clutch facings and brake linings for your tractors, graders, scrapers, shovels and other earthmoving equipment.

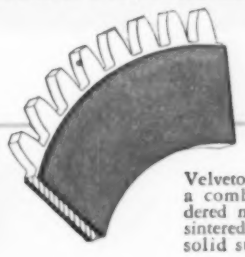
THE S. K. WELLMAN CO.
1374 EAST 51st STREET • CLEVELAND 3, OHIO

Interesting Facts About FRICTION

Friction, both in its total amount and its coefficient, is practically independent of the surface areas in contact, so long as the total pressure remains the same.

Thus, in the illustration, the 10 lb. block has the same coefficient of friction (*f*) in a horizontal position as it does in a vertical position. The amount of surface areas in contact has little or no effect on the friction coefficients. When the pressure becomes abnormally high, however, friction increases at a rapid rate until seizing occurs.

For Brake and Clutch . . . Use Velvetouch



Velvetouch is *all metal*— a combination of powdered metals, compressed, sintered and welded to a solid steel backing plate.

TODAY'S LARGE WALKING DRAGLINES EQUIPPED WITH
PAGE *Automatic* DRAGLINE BUCKETS ARE

OUTSTRIPPING

All Other Digging Equipment!

STRIPPING OVERBURDEN AT 80 FEET

Because of the huge pit the bucket may look like a five yard. Although it handles as smoothly and speedily as a small bucket, it actually is a 25-cubic-yard Automatic digging materials way beyond the capacity of small equipment.

THE Northern Illinois Coal Corporation, operating two draglines with PAGE 25-CUBIC-YARD AUTOMATIC BUCKETS continues to achieve outstanding records in deep stripping of tough overburdens, sometimes in excess of 80 feet. One of these units in its second month of operation produced 740,000 cubic yards of solid overburden in thirty days. Few people realize the significance of such performance. In our opinion, the combination of the large walking dragline and the PAGE AUTOMATIC BUCKET is the greatest digging tool that has appeared in the last fifty years.

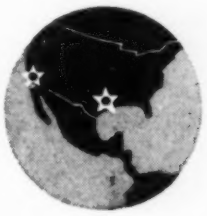
PAGE
Automatic DRAGLINE BUCKETS
PAGE ENGINEERING COMPANY, CHICAGO 38, ILL.

Acid-proof vest with 10,253 buttons

SHOWN HERE under construction is a refinery tower designed to remove undesirable tar materials from high-octane gasoline.

Because the steel shell of the tower will not withstand the corrosive action of separation acids, a chrome alloy lining was specified. 10,253 separate plug welds, each one impervious to acids and able to stand extreme pressures and temperatures, were necessary to secure the tower lining.

An unusual fabrication job, it is another mission completed by Consolidated Steel Corporation for war industries and the armed services. It is an example of the craftsmanship Consolidated Steel will devote to the construction needs of peacetime America. Inquiries looking to future construction are solicited. Address the president.

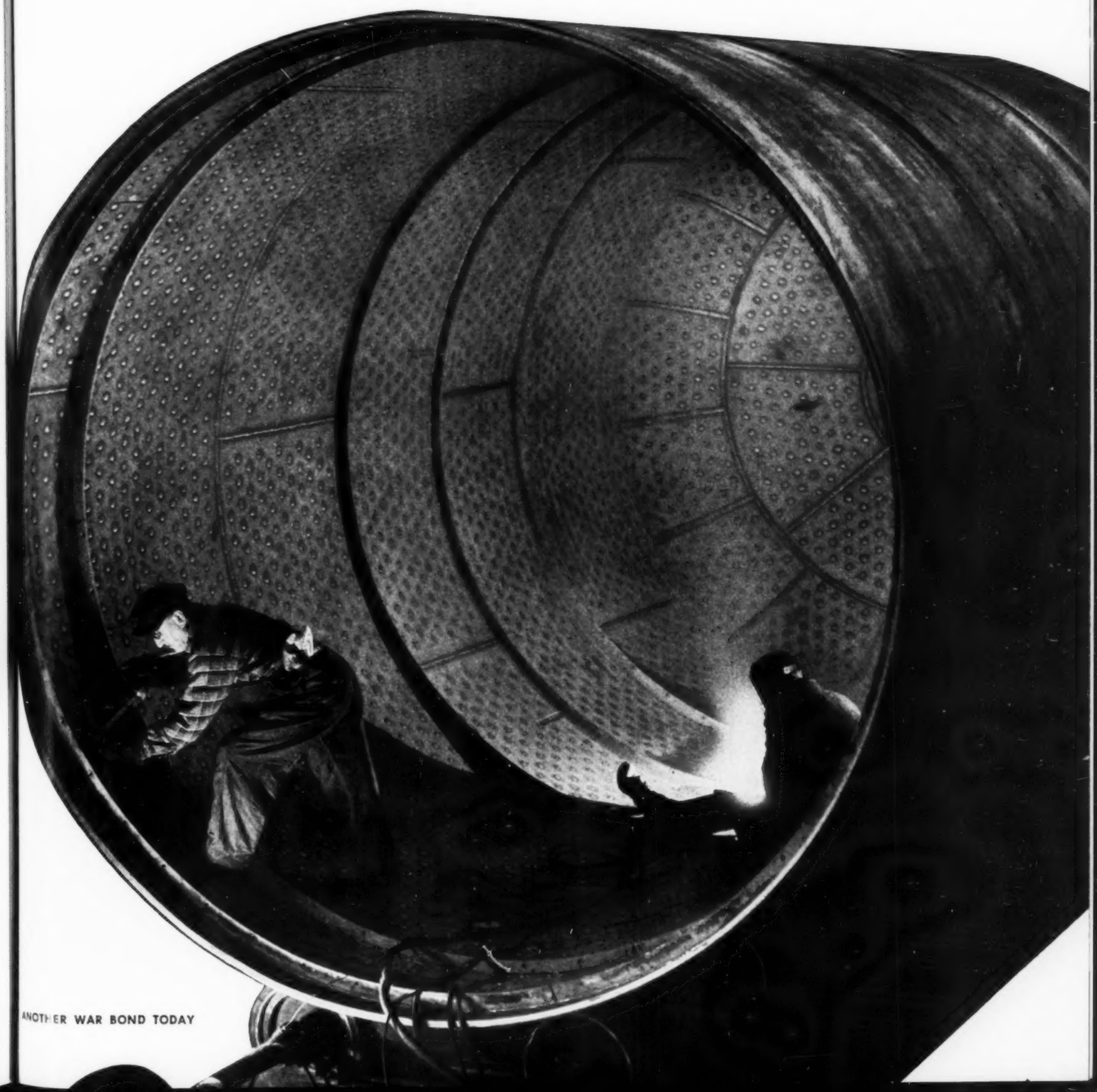


Consolidated Steel

FABRICATORS • ENGINEERS • CRAFTSMEN

CONSOLIDATED STEEL CORP., LTD., LOS ANGELES, LONG BEACH, WILMINGTON, CALIF.; ORANGE, TEXAS

LARGEST INDEPENDENT IN THE WEST



ANOTHER WAR BOND TODAY

HEIL Cable Scrapers are fast-loading

Dependable Power Control Units for all makes of tractors

Smooth-operating brake and clutch assemblies eliminate shocks and jerks; the large drums run cool; the sheaves are designed to reduce wear on cables. Fingertip control gives lightning-fast response for bigger yardage. Designed for all types of cable-operated equipment on all makes of tractors.

Write for bulletins.

SEE YOUR INTERNATIONAL TracTractor Dealer

and unload cleaner with less cable pull

You can pick up heaping bonus loads easier and faster with this efficient Heil Cable Scraper — because it "bites deep" in hard-packed soil just as easily as it loads loose soils like sand.

For improved scraper performance, experienced Heil engineers have developed a scientifically located draft pivot-point, tilting-floor push-out, contoured bowl design, all-welded sections, and many other features that add up to bigger yardage at lower costs. Investigate now and be prepared for post-war equipment purchases.

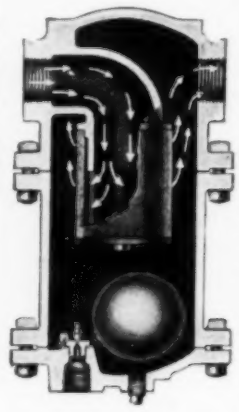
Write for bulletins.

R-35

THE HEIL CO.

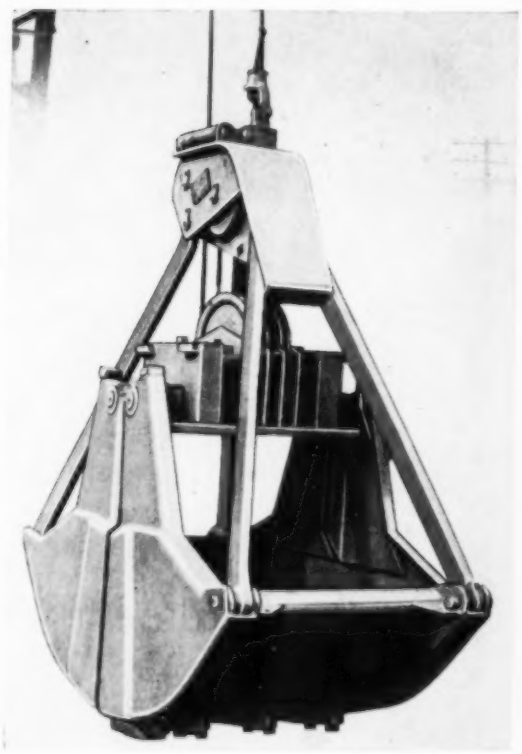
GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

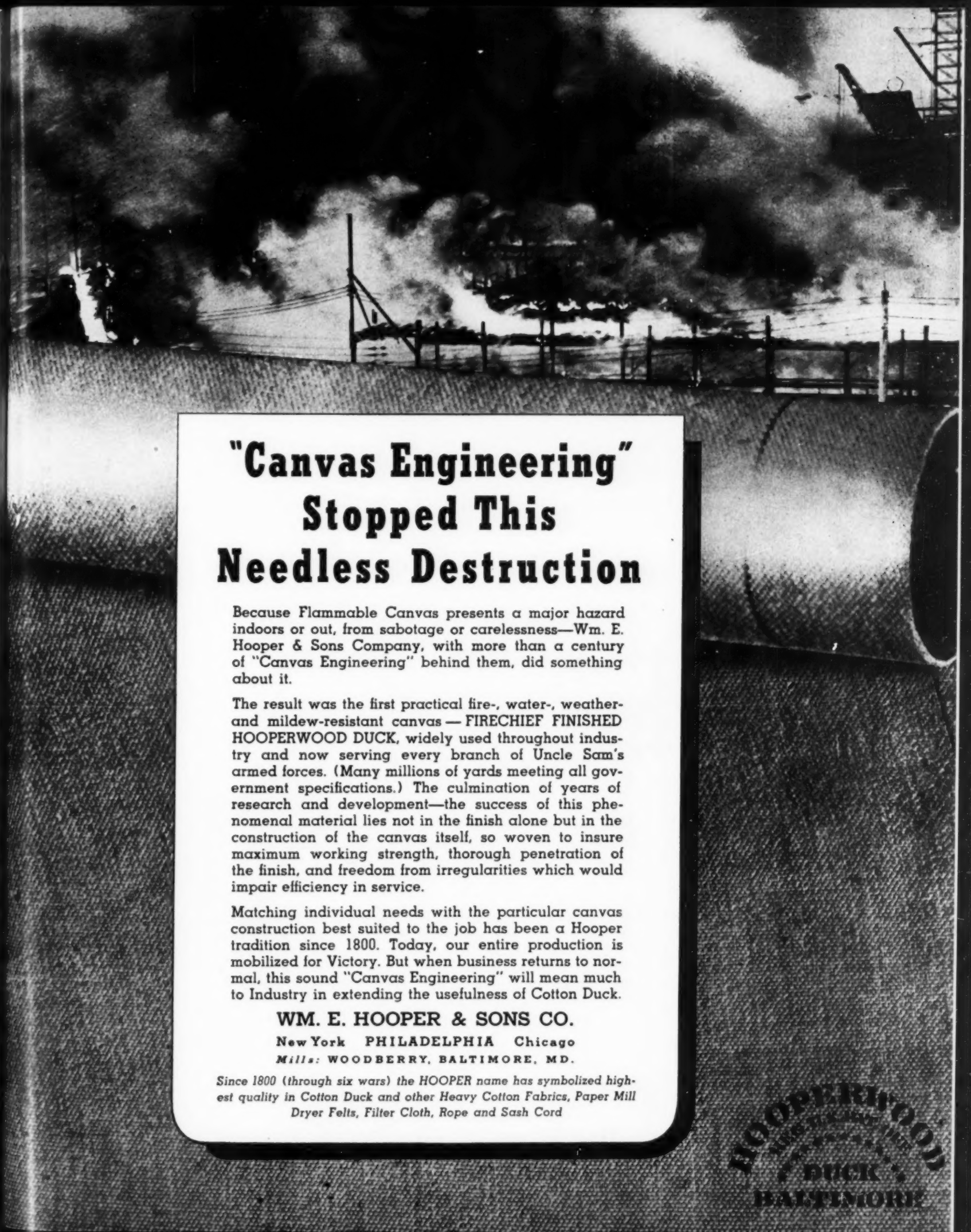
SELF-DRAINING COMPRESSED AIR SEPARATOR, which eliminates the need for external traps and the uncertainties of manual draining, has built-in trap mechanism which releases from the separator, automatically, all the water, oil and other moisture that has been removed from the compressed air. Operation employs two principles: (1) expansion and (2) change of direction. Entering air is first allowed to expand slightly, thereby precipitating most of the entrained moisture. Then it passes through the "thousand baffles"—a labyrinth of coarse wire mesh—changing direction of flow abruptly many times and surrendering the remaining particles of foreign matter. Trap mechanism, with spherical float and chrome steel valve seat, is mounted on bottom plate of separator body and is quickly and easily removed for inspection and cleaning. Available with capacities of 80 or 160 cu. ft. of free air per min. at 90-lb. pressure. Smaller size has inlets of ¾, 1, or 1¼ in.; larger has inlets of 1½ or 2 in.—**Johnson Corporation, Three Rivers, Mich.**



★ ★ ★

ALL-WELDED CLAMSHELL BUCKET in ½- to 2½-yd. capacities, has renewable manganese steel lip to provide wear of ordinary mild steel construction. Closing sheaves are equipped with needle bearings which are protected against dirt and moisture by special synthetic rubber seal. To prolong rope life sheaves are large diameter and guide sheaves have been substituted for guide rollers. All-welded construction. Rehandling buckets ½- to 2½-yd. capacities; heavy digging from ½- to 1½-yd. capacities.—**C. S. Johnson Co., Champaign, Ill.**





"Canvas Engineering" Stopped This Needless Destruction

Because Flammable Canvas presents a major hazard indoors or out, from sabotage or carelessness—Wm. E. Hooper & Sons Company, with more than a century of "Canvas Engineering" behind them, did something about it.

The result was the first practical fire-, water-, weather- and mildew-resistant canvas — FIRECHIEF FINISHED HOOPERWOOD DUCK, widely used throughout industry and now serving every branch of Uncle Sam's armed forces. (Many millions of yards meeting all government specifications.) The culmination of years of research and development—the success of this phenomenal material lies not in the finish alone but in the construction of the canvas itself, so woven to insure maximum working strength, thorough penetration of the finish, and freedom from irregularities which would impair efficiency in service.

Matching individual needs with the particular canvas construction best suited to the job has been a Hooper tradition since 1800. Today, our entire production is mobilized for Victory. But when business returns to normal, this sound "Canvas Engineering" will mean much to Industry in extending the usefulness of Cotton Duck.

WM. E. HOOPER & SONS CO.

New York PHILADELPHIA Chicago

Mills: WOODBERRY, BALTIMORE, MD.

Since 1800 (through six wars) the HOOPER name has symbolized highest quality in Cotton Duck and other Heavy Cotton Fabrics, Paper Mill Dryer Felts, Filter Cloth, Rope and Sash Cord

HOOPERWOOD DUCK BALTIMORE

HOOPERWOOD COTTON DUCK

HIGHWAY TRANSPORT . . . VITAL TO VICTORY AND THE AMERICAN WAY OF LIFE

Weapons in Waiting

Never before has the lumbering industry meant so much to America's welfare.

Wood is the principal material used in Army barracks and war workers' homes. Wood is a vital tool of the shipbuilder and war plant contractor. Landing barges, PT boats and Mosquito bombers are all constructed of wood. Wood has largely replaced steel in Army truck bodies. Wood has been put to a hundred and one new war uses . . . uses which save tons upon tons of critical metals for cannon and shell and fighting equipment.

Trucks opened up vast areas of virgin timber . . . are a main method of moving logs to the mill. Trucks transport a large per cent of the lumber to factories, shipyards, Army camps . . . deliver nearly all of it to farms and war housing areas. Today, the shout of "Timber" is a battle cry of victory.

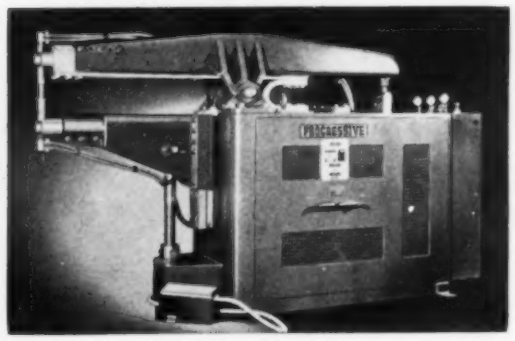
In addition to producing thousands of military trucks and amphibian "Ducks," GMC is now manufacturing several thousand commercial trucks for use in essential civilian occupations. If you are eligible for a new truck, see your GMC dealer first for "The Truck of Value." Remember, too, that your GMC dealer is headquarters for the original truck-saving, time-saving Preventive Maintenance Service.

INVEST IN VICTORY . . . BUY MORE WAR BONDS

GMC TRUCK & COACH DIVISION
General Motors Corporation

Home of GMC Trucks and GM Coaches . . .
Volume Producer of GMC Army Trucks and Amphibian "Ducks"

ROCKER-ARM SPOT WELDER for handling welding of "structural" aluminum sections up to ⅛ in. for aircraft and other types of equipment is claimed to produce 1,000 to 2,000 spots per hour when welding heavy sections. Will handle fairly large size work, throat depth being adjustable from 36 to 42 in. and throat opening from 7½ to 17½ in. In addition to 1-in. working stroke of rocker arm, latter is also



provided with a retracting stroke which provides 4½-in. clearance between points to permit insertion of flanged work and is controlled by foot switch. Controls are provided for three different pressure conditions: Normal welding pressure by foot switch; forging pressure, automatically, and light pressure for tip dressing by toggle and foot switches. Upper and lower arms are designed to handle standard electrodes and holders, but refrigerated welding points may be used, if desired. Pancake-type transformers with 600 turns. Four-position tap switch permits selection of various turn ratios. Base, 35x66 in. Overall height, approximately 5 ft. —**Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.**

Controlled **FRICTION and LONG WEAR**

GATKE Brake Blocks and Frictions — Moulded to machined accuracy in ALL shapes and sizes —

GATKE MAKES
Brake Lining
Clutch Facings
Frictions
Non-Metallic Bearings
Sheet Packing

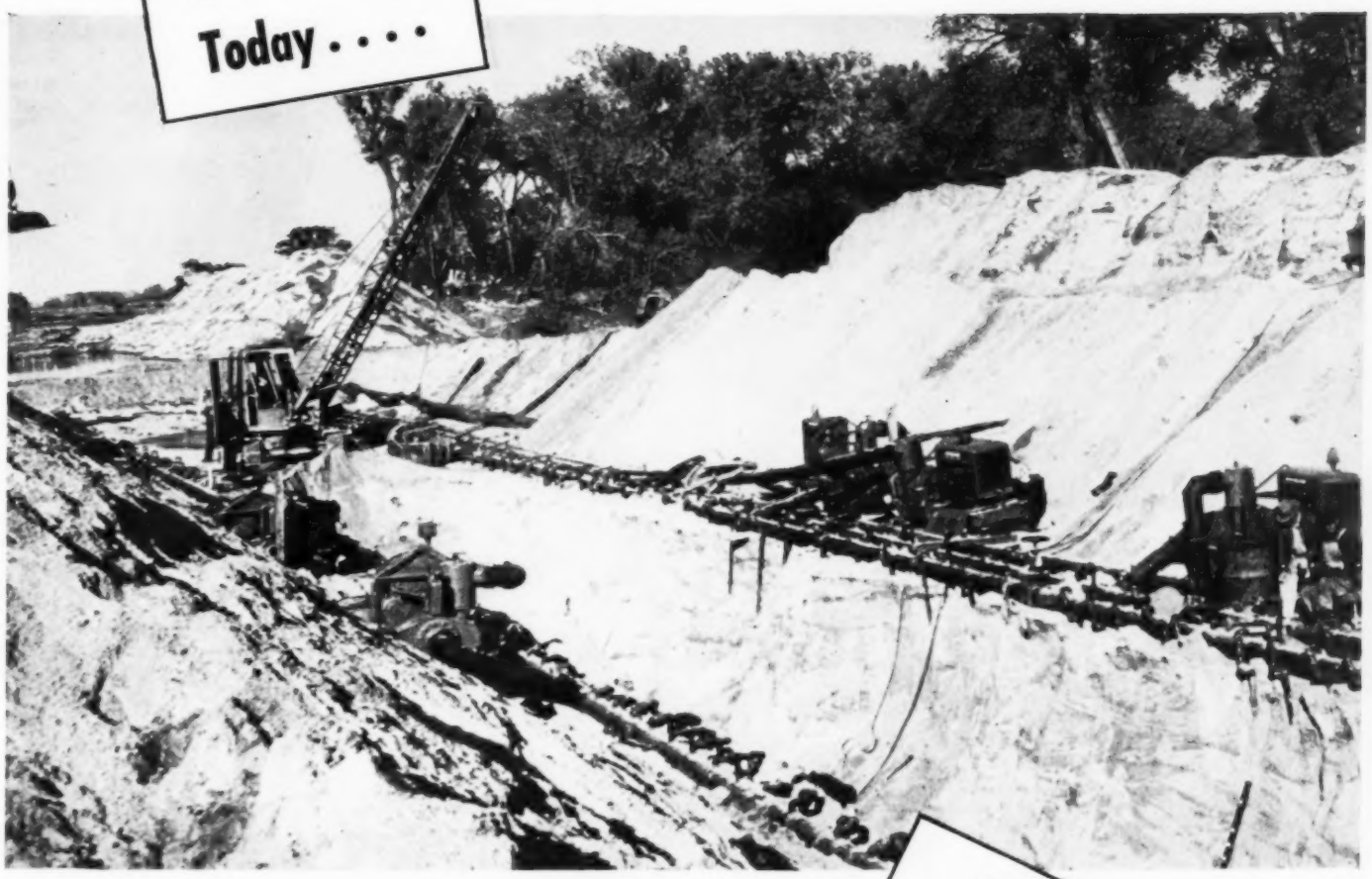
FOR smooth, positive, non-grabbing action for Starting, Swinging, Hoisting and Stopping —you want GATKE High-Heat-Resisting Asbestos Brake Materials.

They are specially engineered and service-proved for all brakes and clutches of Excavating, Road Building and Construction Equipment.

GATKE CORPORATION

226 N. LaSalle Street
Chicago 1, Illinois

WAR WORK
Today . . . .



PEACE TIME
CONSTRUCTION
TOMORROW!

Pipe line jobs such as this, where a BAY CITY handles difficult excavation for J. C. Truman Construction Co., is typical of emergency war work on which continued efficient dragline operation is essential. Tomorrow, when work of this nature is again "Peace-time" construction, the same dependable performance will make money for you on your excavating and material handling. If you are not familiar with the rugged, simplified design, the ease of operation and the low cost maintenance which has always been associated with BAY CITY equipment, why not ask for catalogs so we can get acquainted. Right now all production is going to the Armed Services, which means your old equipment must be checked over more frequently to insure keeping it in good operating condition. You can, however, learn more about BAY CITY by writing Bay City Shovels, Inc., Bay City, Michigan.

BAY CITY SHOVELS
12 Sizes
⅜ to 1½ Yard
Also truck mounted shovels and cranes

BAY CITY

SHOVELS • CRANES • DRAGLINES • TRENCH-HOES • SKIMMERS

A Griffin Wellpoint Job

A Blueprint *that* was never used!

The contractor planned to use a steel cofferdam after seeing the troubles of a fellow contractor a few yards away. Piling was ordered and bracing about to be cut when a GRIFFIN man came on the job and GUARANTEED to DRY the excavation so the banks could be sloped, and thus eliminate the cofferdam.

Results count — Why say more?

●

For Sale and for Rent

MID-WEST

GRIFFIN EQUIPMENT CO., INC.
548 Indiana Street • Hammond 1662
HAMMOND, INDIANA

SOUTH

GRIFFIN ENGINEERING CORP.
633 N. Myrtle Ave. • Jacksonville 5-4516
JACKSONVILLE, 4, FLA.

MAIN OFFICE: 881 EAST 141st STREET, NEW YORK 54, N. Y.
GRIFFIN WELLPOINT CORPORATION

METAL ETCHER marks numbers, sizes and other information on tools, gages, reamers, dies, punches, jigs, fixtures and any other units made of iron, steel or its alloys. Depth of mark which is burned into surface so it cannot be worn off by ordinary usage is controlled by speed of writing and four etching

heats, 120, 240, 420 and 700 watts. Outstanding features include red indicating lamp, protected four-heat switch, removable hinged cover, terminal tap for 2-oz. etching tool and renewable work plate. All parts inclosed in compact case. In addition to 4-oz. etching tool, 2-oz. tool is available for marking thin, delicate parts. Overall size, 7¼x5⅛x8½ in. Weight, 16 lb.—**Ideal Commutator Dresser Co., 1368 Park Ave., Sycamore, Ill.**

Shunk *Snow Plow and Ice Removal* **BLADES**

Proved record of superior performance. Made of specially developed steel to withstand severe service conditions.

FOR ALL TYPES AND MODELS OF SNOW PLOWS
Various widths, lengths, thicknesses--flat or curved--standard or special--punched ready to fit your machine.

SHUNK SAW-TOOTH ICE BLADE
Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.

Shunk
MANUFACTURING COMPANY
ESTABLISHED 1854
BUCYRUS, OHIO.

There's been a big change

THE principle of flight is the same. It's the *improvements in design* that have made possible the amazing performance of today's planes.

Same with tapered roller bearings, too. Engineers have long known that more rollers mean greater load capacity and longer bearing life.

But it remained for Tyson to develop the "all-rolls" bearing—with *thirty percent more load-carrying rollers*—and give the world a sturdier, longer-lasting heavy-duty bearing.

* * *

The big name in bearings today is . . . **TYSON!**

TYSON BEARING CORPORATION, MASSILLON, OHIO

COUNT THE ROLLS · THE ROLLS COUNT

Tyson

TODAY'S HEAVY-DUTY BEARING

★ KEEP ON BUYING WAR BONDS ★

"What can Macwhyte PREformed Wire Rope do for Me?"

Here are specific ways you benefit from the use of Macwhyte PREformed wire rope.

First, you get longer wire rope service for 3 reasons:

1. PREformed has less internal fatigue.
2. PREformed has less internal friction.
3. PREformed has better balance.

Each wire and each strand are PREformed before being laid into the finished rope. The detrimental effects of internal friction and internal fatigue, two of wire rope's greatest destroyers, are reduced to a minimum in Macwhyte PREformed. There is perfect balance. Each strand and wire carries its share of the load.

Second, you get lower cost per load carried.

In Macwhyte PREformed, every strand in the wire rope is under uniform tension. There is no "early wearing out" of some strands while the others "loaf." This perfect balance makes possible lower cost per load carried on the job.

Third, you get fewer shut-downs, less trouble.

Fewer shut-downs are the rule, because PREformed lasts longer. In these times, lost man hours due to repairs or replacements can be disastrous. PREformed helps prevent this.

Less trouble is encountered because PREformed is flexible, easy to handle. The perfect balance of strands means that PREformed is kink-resistant, very easy to take off the reel and put on your equipment.

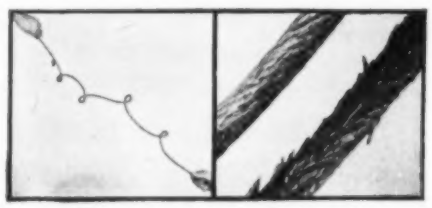


Figure A *Figure B*

Fourth, you have less chance of rope loss or workman injuries.

Macwhyte PREformed is not likely to curl up *(Figure A)* during unreeling and installing. Therefore, the risk of kinking and permanently damaging the rope is greatly diminished.

Nor does PREformed wire rope wicker and become dangerous to handle *(Figure B)*. A wire broken from wear in a PREformed rope lies in place, does not wicker out to injure workmen's hands.

In addition to these 4 specific benefits, add this 5th: Macwhyte Internal Lubrication that goes around every wire in every strand of Macwhyte PREformed wire rope.

Inside bearing surfaces of wires are thus protected against friction and corrosion. All spaces between wires are filled with lubricant to keep out moisture and resist ordinary acids. This tenacious, heavy lubricant Macwhyte uses, clings to wires unaffected by the hottest, coldest, driest, or most humid temperatures.

Macwhyte engineering experience may help you. Tell us your problem. We'll assist you in getting the *correct* rope for your equipment.

MACWHYTE PREformed WIRE ROPE — Plus Internal Lubrication Selected Steels Tested-Proved

The correct rope for your equipment

NO. 754

MACWHYTE COMPANY

Wire Rope Manufacturers

ARMY E NAVY

2941 FOURTEENTH AVENUE KENOSHA, WISCONSIN

Mill Depots: New York · Pittsburgh · Chicago · Fort Worth · Portland · Seattle · San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and Internally Lubricated Wire Rope · MONARCH WHYTE STRAND Wire Rope · MACWHYTE Special Traction Elevator Rope · MACWHYTE Braided Wire Rope Slings · MACWHYTE Aircraft Cables and Tie-Rods · MACWHYTE Stainless Steel Wire Rope · MACWHYTE Monel Metal Wire Rope

THICK or THIN -HOT or COLD

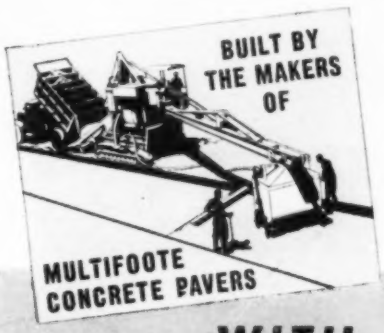
It's all the same to an ADNUN

You can lay any mix—hot or cold—any thickness —any width—with an Adnun Black Top Paver. It's exclusive method of Continuous Course Correction automatically assures more accurate distribution and depth of material as well as smooth finished surface. The Power Cut-Off, with hydraulically controlled gates provides positive control of the flow of materials and prevents grade inequalities. Overlapping action at the Cutter Bar produces a tight joint at the curb or against the paralleled courses. Hydraulic controls mean fatigueless operation.

Adnuns lay crushed stone or slag accurately and fast in single courses as deep as 6" or better or sheet ashphalt only a fraction of an inch thick. Black top paving laid by Adnuns is noted for maximum density, tight joints between strips, smoothest finished surface, and all-weather durability. Adnun Black Top Pavers were first in the field and still lead in performance. Write today for literature.

THE FOOTE CO., INC., Nunda, New York

The World's Largest Exclusive Manufacturers of Concrete and Black Top Pavers



ARMY E NAVY

ADNUN

TRADE MARK REGISTERED

BLACK TOP PAVER

WITH CONTINUOUS COURSE CORRECTION

DIXIES CUT DOWN ON "Time out"

Sick absenteeism and "time out" take a sudden drop, when crisp individual paper cups come on the job. The old water bucket and its tin dipper are outlawed. Dixie's Portable Water Carrier brings the water to the men at their work, serving them in individual Dixie or Vortex paper cups.

Colds and other illnesses that cause much of the avoidable absenteeism are blocked at their source. Used by one person only, these health protecting cups break the chain of mouth-to-mouth contagion.

LESS "GABBING"

By eliminating trips to the water wagon, this portable water service cuts down "visiting" on the job. Yes, it keeps men on the job, in more ways than one . . . results in a noticeable step-up in construction schedules.

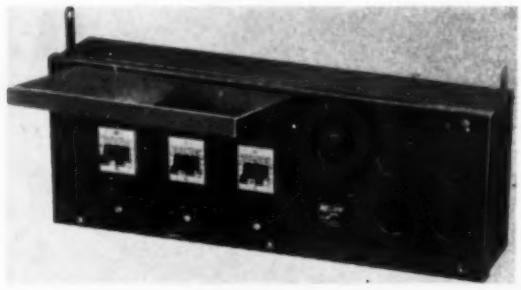
Write for descriptive folder giving complete information on this portable water service, including tanks, dipensers and cups.

Dixie and Vortex Cups are made at Easton, Pa., Chicago, Ill., Darlington, S. C., and Toronto, Canada.

DIXIE CUPS

DRINKING CUPS AND FOOD CONTAINERS

CIRCUIT BREAKER SCATTER BOX, controlling temporary power and light circuit through a central unit, is designed primarily for shipyards and similar locations where a number of temporary circuits must be set up and torn down quickly. The Square D device is built for from four to eight circuits with or without neutral. Circuits are pro-



tected by 15-amp. 115-v. single pole, type MO multi-breakers (circuit breakers) although 20- or 25-amp. breakers can be substituted. Hinged cover of scatter box may be padlocked and openings for plug receptacles are provided. One 1-in. knockout in each end is included and the box has a pair of ears for hanging. Receptacles or internal wiring are not provided. Application of scatter boxes to mass production of aircraft ships is as recent as the war, but it is believed that they will find general usage in housing construction, commercial and industrial building and other projects where temporary distribution of comparatively light loads is required.—**Square D. Co., 6060 Rivard St., Detroit 11, Mich.**

UNTIL THE LAST GERMAN CRIES "KAMERAD"

the U. S. Engineers need BYERS cranes more than civilians do . . . and the Engineers are getting them

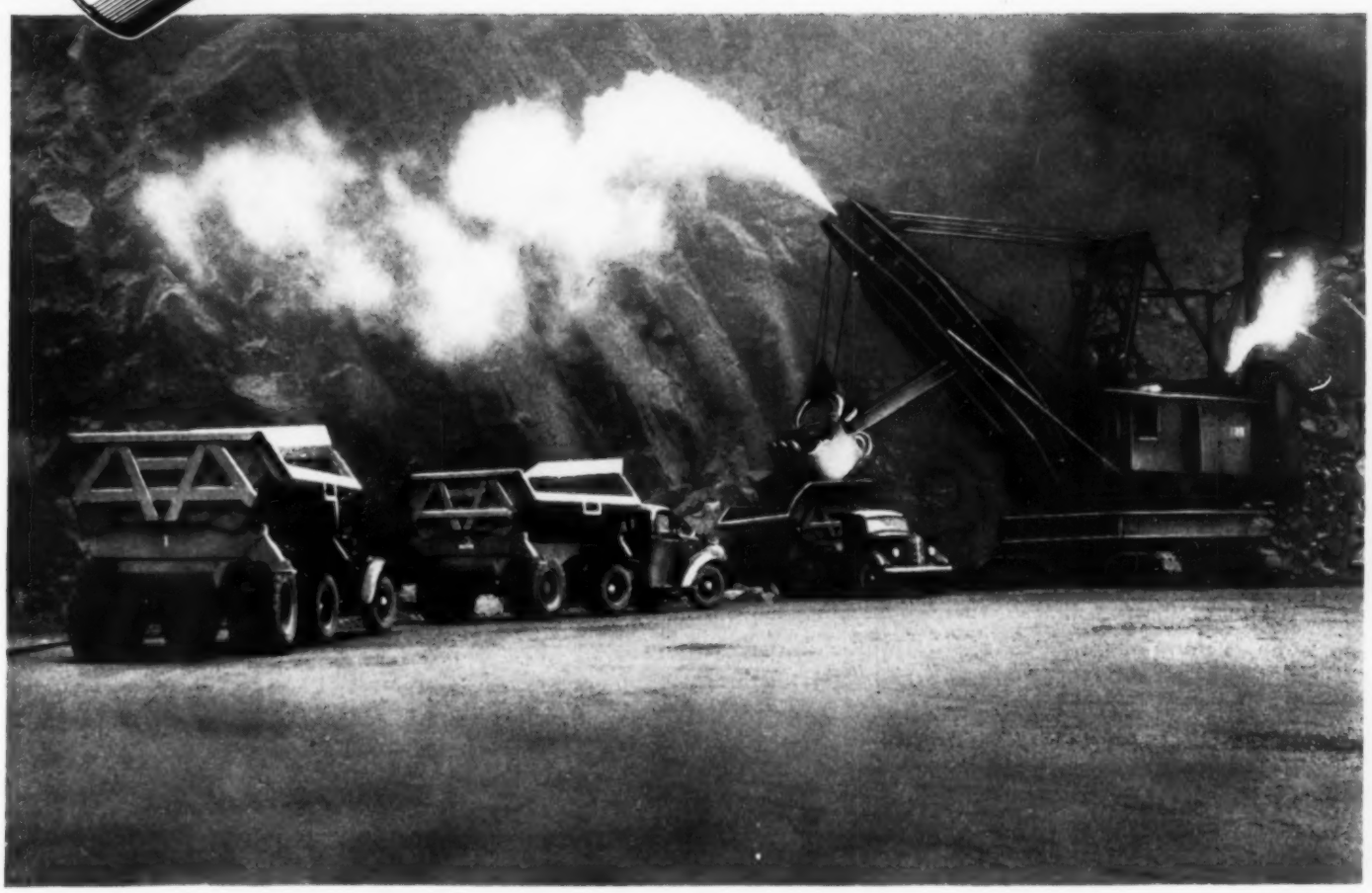
In the meantime, owners of current and older models of Byers shovels and cranes may depend on Byers Parts Service to help them keep present equipment working steadily and satisfactorily.

BYERS CRANES AND SHOVELS RAVENNA, OHIO
DISTRIBUTORS THROUGHOUT THE WORLD

Better LUBRICATION

MEANS

Better Maintenance



• Excessive wear and difficult maintenance often result from inadequate lubrication.

Sinclair provides highly specialized Motor Oils, Gear Oils and Greases for *better lubrication* and better maintenance of *CONSTRUCTION EQUIPMENT* under continuous heavy duty operation. Sinclair Ten-ol 200 has been specially developed for proper lubrication of Diesel engines, and Diesel-powered shovels, buckets, and bulldozers.

• • •

(Write for "The Service Factor" — published periodically and devoted to the solution of lubricating problems.)

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Warren Paving Plants *Are Protected by Manganese Steel*

Noteworthy cases of time savings and "beating the promise" on paving jobs through the use of Mobile Asphalt Paving Plants have been frequent

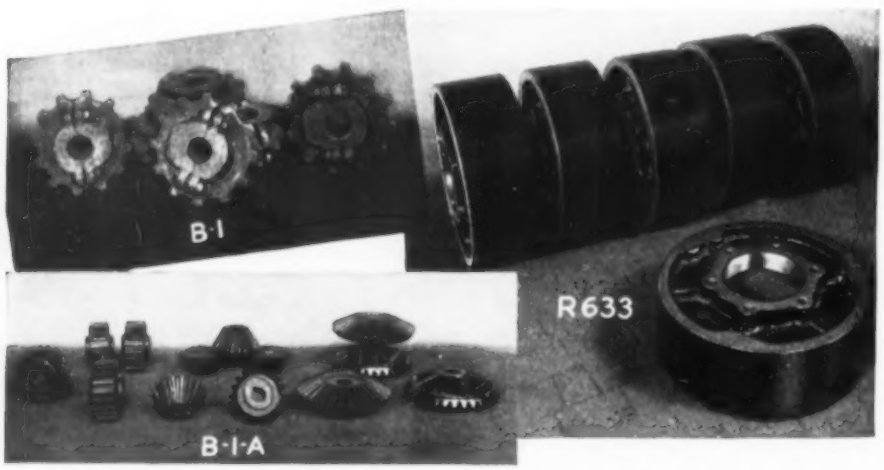
during the "girding for war" period. A typical plant, designed and constructed by Warren Brothers Company, Cambridge, Mass., is shown in Photo 489-B. Plants of this type, which are readily moved from job to job and quickly set up for operation, have been used in over one hundred war paving projects.

Warren Mobile Asphalt Paving Plants are designed to complete the job with the greatest possible speed, at minimum cost and with maximum productive utilization of labor.

Such equipment must be built to operate continuously, with the least possible time lost for repairs and replacements. At the same time, the wearing parts are subjected to heavy loads, shocks and abrasive wear. Obviously, to use ordinary iron or steel parts would result in costly operating delays.

Continuous operation of these plants has been aided by the use of austenitic manganese steel for the wearing parts. Manganese steel trunnion rollers (Photo R-633) support the revolving drying cylinders or kilns. In the asphalt mixers, manganese steel split sprockets (B-1) and gears and pinions (B-1-A) are employed, and the mixer arms are likewise made of manganese steel. In these and other applications in Warren Equipment, the resistance to breakage and wear of "the toughest steel known" assures long life and uninterrupted production.

Ask for Bulletin 1143-CI, "Manganese Steel for the Construction Industry."

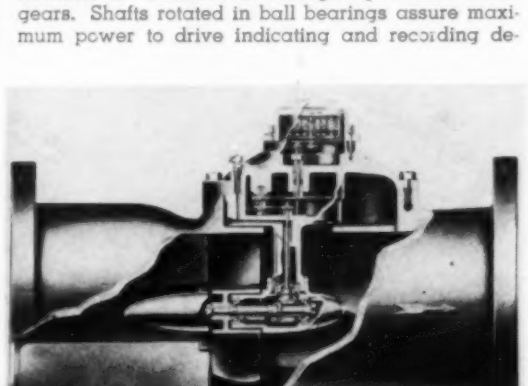


Send for Bulletin 941-W on Amsco Conservation Welding Rods.

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN Brake Shoe COMPANY

PROPELLER-TYPE FLOW METER, called "Propeloflo," for waterworks main lines 6 in. and larger, is of streamline Venturi construction and has an eight-blade Bakelite propeller molded in one piece. Rotation is transmitted through spur and bevel gears. Shafts rotated in ball bearings assure maximum power to drive indicating and recording de-



vices or proportioning chemical feeders. Venturi throat evenly distributes force of flow against full area of propeller, resulting in improved accuracy throughout an exceptionally wide range of flow. Spiral flow is eliminated by straightening vanes just upstream of propeller. Easy to service because of its "one-shot" lubrication system, readily accessible stuffing box and the ease with which the propeller mechanism may be removed from the line for inspection. Blank cover may be installed when meter is removed.—**Builders Providence Inc., 9 Codding St., Providence 1, R.I.**

For a "GOOD BUY" in SHOVELS

Ask for The ONLY SHOVELS with BLADE EDGES

GUARANTEED SPLIT-PROOF

INGERSOLL SHOVELS
"The Borg-Warner Line"

Write for Catalog and Prices
INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
New Castle, Indiana
Plants: New Castle, Ind.; Chicago, Ill.; Kalamazoo, Mich.

AMERICA IS *Built with Aggregate!*

THIS is the home of national champions. They earned their title because of superior performance, teamwork, and the will to win.

Building a strong, safe, and permanent stadium like this requires similar qualities. The cooperation and spirit are American free enterprise which developed the equipment for producing huge quantities of low cost aggregates able to meet strict specifications. Such aggregate is produced by Cedarapids crushing equipment which has been constantly improved to provide the utmost in quality of products, low cost, and volume of production.

When you are figuring peacetime contracts for highways, airports or other engineering construction, that have made America strong, base your estimate on aggregate produced by Cedarapids equipment. Even though a large part of Iowa's production is still going to war you can always get more Cedarapids equipment for essential civilian use. Let us help you with the necessary releases and priorities. Come to Iowa, first, the home of Cedarapids aggregate producing and crushing equipment.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

Cedarapids
Built by IOWA

THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS — TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

Pictured above is a lineman Ned Ingalls who, with the aid of a Coffing "Safety-Pull" hoist, is man-handling a soon-to-be "hot" wire, as he imitates the "man on the flying trapeze" from his dizzy perch at Grand Coulee Dam.

COFFING HOISTS

We do not claim that Coffing Hoists are the final and perfect achievement, but for 16 years our hoists have been doing their jobs well.

We do claim that Coffing Hoists are the best we know how to build and experience shows them to be generally efficient. (The Army and Navy wouldn't be using them if they weren't.)

We hope that Coffing Hoists are helping to hasten the day of peace—the day our boys can come home again—the day you can call your supplier and say: "Send me a Coffing Hoist"; and your supplier can reply: "Coming right up, brother, we've got 'em in stock."

WRITE TODAY FOR CATALOG No. DG-6

RATCHET LEVER HOISTS

SPUR GEARED HOISTS

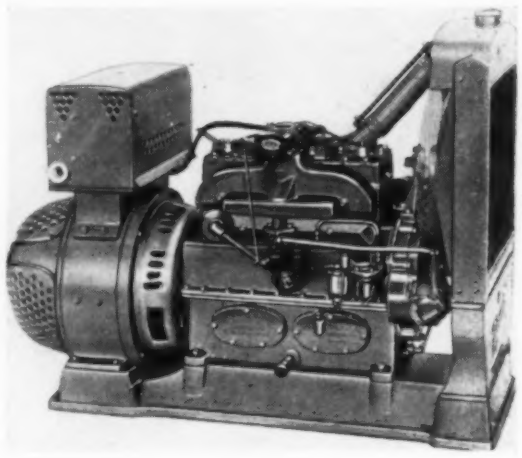
ELECTRIC HOISTS

COFFING HOIST COMPANY
Danville, Illinois, U. S. A.

FINE TOOLS help keep vital construction equipment on the job—help speed every service and maintenance operation. Snap-ons are recognized everywhere for speed, flexibility and rugged durability. *Write for catalog.*

SNAP-ON TOOLS CORPORATION, 8084-I 28th Ave., Kenosha, Wis.

FULLY AUTOMATIC AC GENERATOR, gasoline-engine-driven 110-112-v. plant with a capacity of 5,000-6,000 watts, two wire, 60 cycle, has all controls mounted on the plant and all wiring placed on a wall-mounted control panel, thereby reducing installation costs and making it possible for the unit to be used for portable service. All relays are actuated by dc-exciter current,

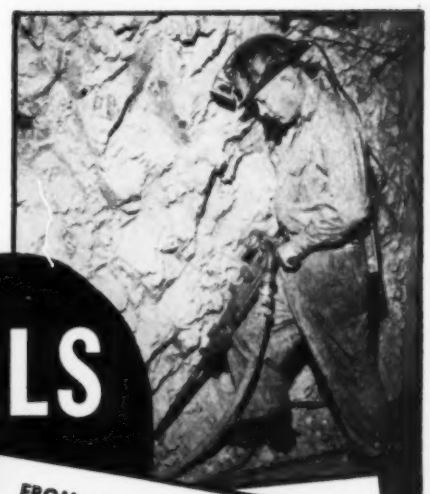


eliminating vibration and chatter. Quick-make, quick-break relays provide instantaneous light even when starting with low wattage loads. Transformer-type operating relay and solenoid line contactor with silver contacts assure positive starts and stops under all climatic conditions. Relays, self-adjusting and require no servicing. Plant starts automatically when any load of 60-100 watts is turned on and stops automatically when last load is turned off. Service disconnect switch prevents automatic operation during periods when plant is being inspected, lubricated or serviced. Automatic circuit breaker prevents extreme overload which would damage electric or mechanical parts.—**Universal Motor Co., Oshkosh, Wis.**

★ ★ ★

AIR-STRAINER WATER TRAP, for relieving difficulties caused by water in air lines in compressed air operations and for reducing lubrication needs and cutting maintenance costs, operates on principle of high velocity impingement on cold surface in three stages to remove moisture and oil. Easily installed in any pipe line and should be placed in an air supply line nearest the air grinders and air tools with which it is used. Outlet conections serve four pieces of equipment. Water exhaust valves are provided for occasionally releasing trapped water. Eliminates replacements of air equipment and does away with discomfort of oily, wet, soiled clothing.—**Inco Engineering Co., 200 Third St., N.E., Cedar Rapids, Iowa.**

We Quote - CONTRACTORS EVERYWHERE...



Thor ROCK DRILLS

"OUT-DRILL EVERYTHING ON THE JOB"

FROM A MAMMOTH PENNSYLVANIA TUNNEL JOB*

"Thor Rock Drill was put through rugged stripping tests and out-drilled everything on the job, showing exceptionally powerful hole-blowing capacity by holding to steady drilling despite hitting three inches of clay every three or four feet."

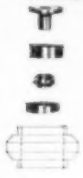
FROM AN ARIZONA DEVELOPMENT*

"Thor Rock Drill used in five different veins of varied texture and hardness showed such excellent results that runners took it apart to admire fine construction."

FROM A COLORADO CONTRACTOR*

"Thor Rock Drill drilled as deep as 25 feet in clay streaked conglomerate rock with amazing hole-cleaning power...out-drilled every other tool on every operation."

CONTRACTORS ARE *SOLD* ON THESE THOR PERFORMANCE AND MAINTENANCE FEATURES

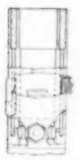


● LOW AIR CONSUMPTION

Thor Positive Short-Travel Tubular Valve uses effectively every ounce of air that enters the machine . . . measures air to a tolerance of .00025 of an inch!

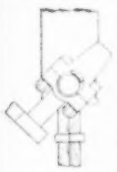
● STEADY, FAST DRILLING

Extra-powerful rotation through extra sturdy rifle bar assembly and positive, non-slip ratchet action prevents stalling, even in heavy, sticky formations . . . full air power behind the piston gives the steel maximum forward and rotating power.



● AUTOMATIC LUBRICATION

On each reciprocation of the Thor piston hammer, oil is forced under pressure through a felt filter pad to keep every part of the machine constantly lubricated.



● OPERATING EASE

The Thor four-position throttle gives the operator complete control of drilling speeds for all operating conditions. Exclusive Thor spring retainer design provides quick, easy removal of the steel—provides longer life with fully enclosed springs that cannot clog or be over-tightened.

● POWERFUL HOLE-BLOWING

Thor air economy in turning every foot of air into power combines with powerful rotation to provide steady, maximum hole-cleaning ability.

Send today for complete information about Thor's wide range of light and heavy duty sinker, drifter and stoper rock drills and associated contractors' tools in Catalog 42-A.

Straight from the work come these reports of Thor Rock Drills *out-drilling everything on the job* in all types of underground and surface hard-rock operations.

On-the-job tests like these are making Thor Rock Drills the popular choice of contractors everywhere who *know* Thor performance . . . who *know* the low maintenance, smoother, faster handling made possible by Thor design and construction.

*Name furnished on request.

Thor Portable Pneumatic and Electric Tools

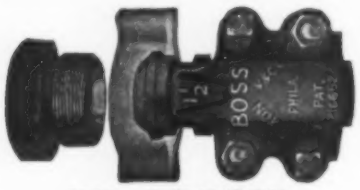
INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

Four Reasons Why Construction Men Rely on DIXON Couplings

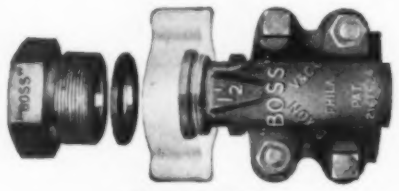
The four couplings described below are typical of the practical design, careful manufacture and high utility value of all DIXON products . . . America's most complete line of industrial hose fittings.



"G J-BOSS"

GROUND JOINT STYLE X-34
FEMALE HOSE COUPLING

For high and low pressure steam, air and liquid hose. Ground Joint construction provides permanently leakproof, soft-to-hard metal seal when wing nut is tightened. "BOSS" Offset Interlocking Clamp anchors coupling to hose with a powerful, full-circumference grip, without pinching. Corrugated stem assures added holding strength. Made in sizes ½" to 4", inclusive, and furnished with male or female spuds.



"BOSS"

WASHER TYPE STYLE W-16
FEMALE HOSE COUPLING

Same as "G J-Boss" coupling, except for method of sealing. Stem is extra strong, full length and has deep, clean corrugations. "BOSS" Offset Interlocking Clamp has exceptionally large gripping area that holds tight over the entire circumference of the hose to prevent leaks and pressure losses. Easily connected and disconnected. Made in sizes ¼" to 4", inclusive, and furnished with male or female spuds.

"BOSS" MALE COUPLING

STYLE MX-16

Companion to Ground Joint and Washer Type Female Couplings. Built to assure maximum strength, durability and safety on steam, air and liquid hose lines, including oil, butane, ammonia, etc. More convenient and economical than regular iron pipe nipples, as each size fits same size straight end hose. Can be quickly reset on the job. Sizes: ¼" to 4", inclusive.

"AIR KING" HOSE COUPLING

Quick-Acting, Universal Type

Quickly connected by a "twist of the wrist". No mechanism to foul up or cause trouble. Locking heads of pipe ends and hose ends all one size, regardless of I.P.T. or hose size. Shanks of hose ends are long, amply corrugated and smoothly finished.

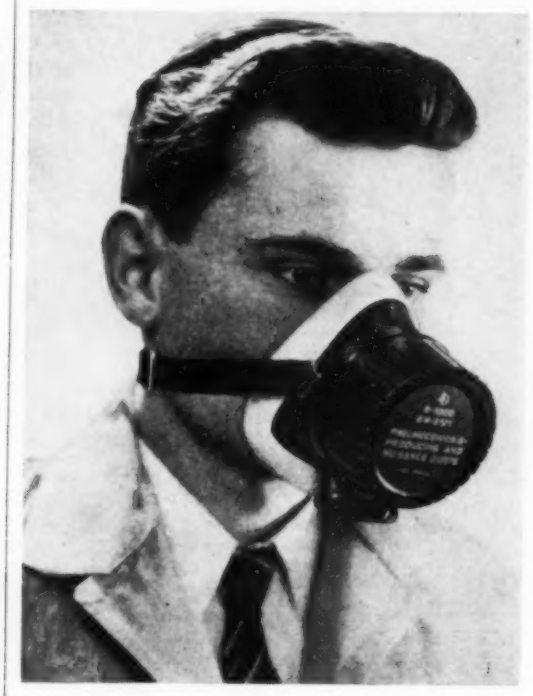
Patented auxiliary locking arrangement provides absolute safety for services involving extreme vibration.

Male and Female Pipe Ends, Sizes ¼" to 1". Hose Ends, Sizes ⅜" to 1".

Carried in Stock by Manufacturers and Jobbers of Mechanical Rubber Goods.

DIXON
VALVE & COUPLING CO.
Main Office and Factory: PHILADELPHIA, PA.
BRANCHES: CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON

KNITTED COTTON "Facelets" are now being furnished for use with the R-1000 respirator, developed to protect workers against certain dust, fume and gas hazards. These facelets are claimed to make

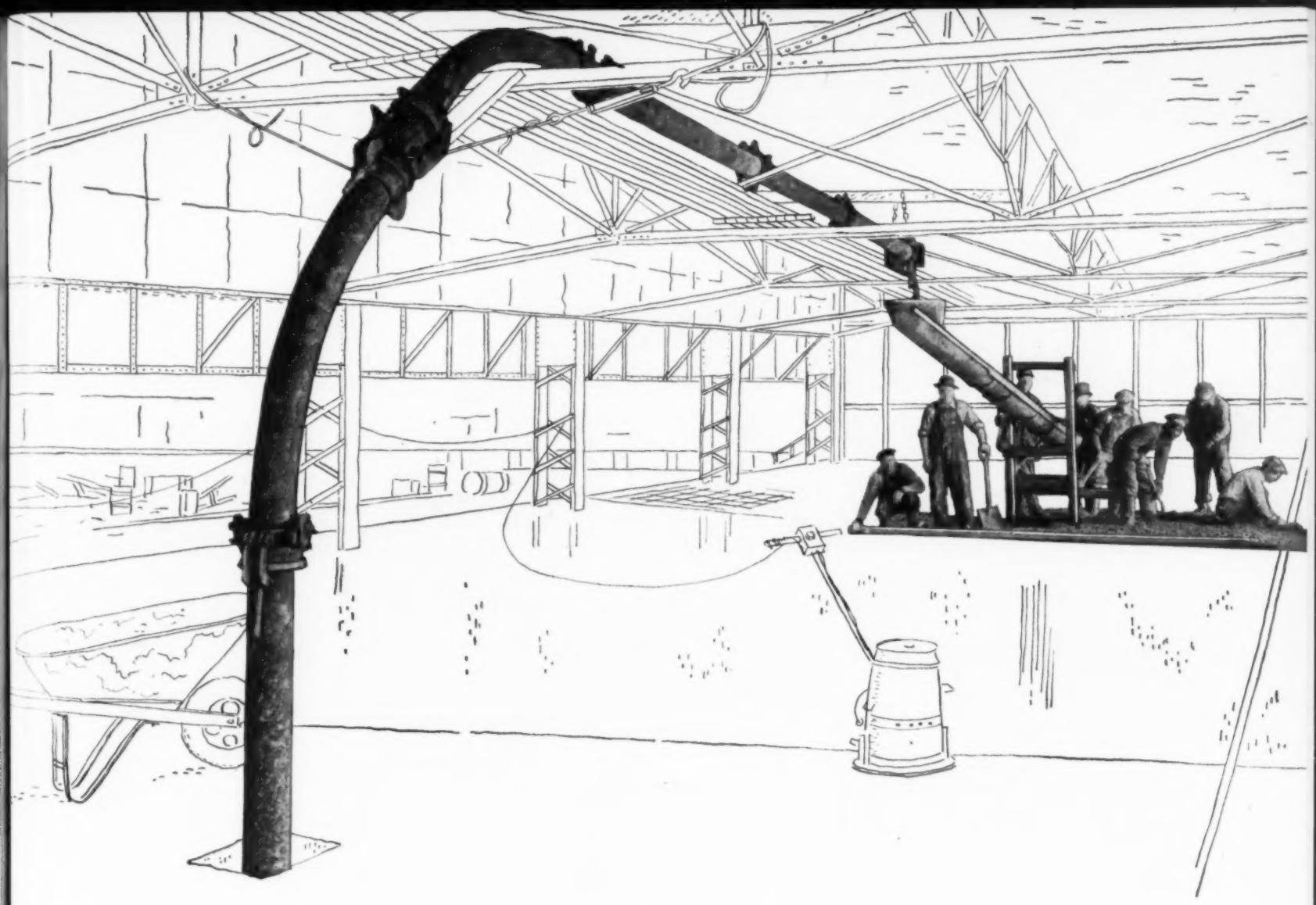


any respirator more comfortable to wear because they are soft, absorb perspiration and provide a certain measure of protection against dust and dirt. Especially valuable to workmen who handle such products as cement, lime and gypsum or perform operations like paint spraying.—**American Optical Co., Southbridge, Mass.**

★ ★ ★

GASOLINE-ENGINE-DRIVEN COMPRESSOR has been built to supply air for marine diving, scaling, sand blasting, painting and other activities of this type where different pressures are required for operation of various tools on same job. May be had with skid mounting or with four steel wheels or four

pneumatic tires and with 24x72-in. horizontal air tank mounted overhead. Air line from air receiver to overhead tank contains after-cooler, and line from overhead tank to manifold has moisture separator, with drain to automatic trap to remove and expel moisture. Three-way manifold is mounted and each line consists of globe valve, air regulator with gage and hose coupling. Four lifting brackets are provided for use in jacking, carrying bars or for slings.—**Schramm, Inc., West Chester, Pa.**



Like Putting the YOLK IN AN EGG...

It was just like putting the yolk in an egg, this job of putting a new concrete floor in the second floor testing room of this busy war plant. It had to be done without disturbing the workers in the rest of the plant and impeding production. Concrete could not be run down from the roof or hauled up from the ground in an old-fashioned manner without interfering with somebody —for this room was truly in the middle of the plant.

Actually, the solution was easy . . . Rex Pumpcrete. No chutes, no hoists, no towers, no buggy runs . . . just a pipe line. The pipe line was run from the Pumpcrete through one of the first floor windows, up through the ceiling and along the second floor to the testing room. The Pumpcrete pumped concrete through the pipe line in a fraction of the time it would have taken with old-fashioned methods.

To simplify your difficult concrete placing jobs . . . to speed up placing time . . . check Rex Pumpcrete. It pumps concrete vertically as high as 120 feet or horizontally as far as 1200 feet.

For complete information on Rex Pumpcretes, send for descriptive bulletins. And check the other Rex construction equipment: Moto-Mixers, to speed the mixing, hauling and placing of concrete . . . Pumps, that move water economically and efficiently . . . Mixers, that cut concrete mixing costs . . . Pavers, that can give you really heavy yardage production, faster. See your Rex Distributor or write direct to Chain Belt Company, 1664 West Bruce Street, Milwaukee 4, Wisconsin.

CHAIN BELT COMPANY ***of Milwaukee***

REX

CONSTRUCTION MACHINERY

175,000 Sq. Ft. of floor space. Machine, Forge, Heat Treat, Structural, Pattern, Carpenter, Paint Shops; Central Heating Plant and Office.

WARCO
W. A. RIDDELL CORPORATION

AND

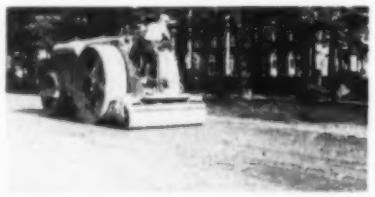
HERCULES
HERCULES ROLLER COMPANY

BUCYRUS — OHIO

CURRENT PRODUCTION

WARCO GRADERS

HERCULES ROLLERS



POST-WAR PRODUCTION

HYDRAULIC SCOOPS	LIGHT MAINTAINERS	TERRACING GRADERS	ROTARY SCRAPERS

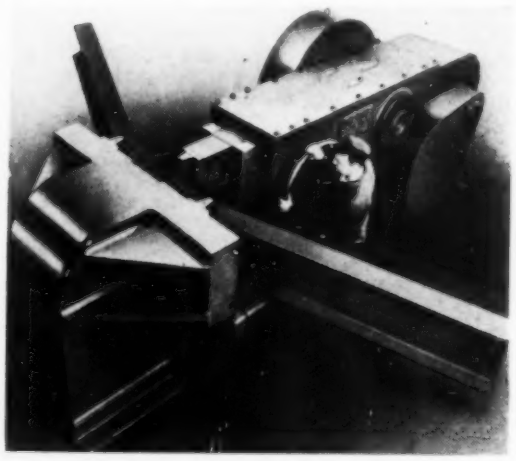
Clipper
MASONRY SAWS
A special shape or shorter length need only be as far away as your Clipper Masonry Saw. The basic feature of Clipper is the new multiple cutting principle . . . . a method developed especially for Masonry Materials. You can be sure to cut with the fastest cutting speed and to obtain the longest blade life. Write for Catalog.
CLIPPER
MANUFACTURING CO.
4037 Manchester St. ST. LOUIS, MO.

HEAVY-DUTY WIRE CUTTER, known as "Lil' Giant," has leverage range of 40 to 1 and will cut up to ¼-in. bolts or wires and ⅜-in. stranded cable. Standard tool steel blades will meet all normal cutter requirements and will be fitted for special uses, if desired. Insulated handles of plas-

tic with high dielectric strength are optional. Cutting blades are easily replaced by adjusting a screw and nut. To provide for regulating the distance between cutting edges, small, instantly adjustable cam allows for a range permitting of wear allowance for sharpening of dulled edges. Length overall, 15 in. Weight, 26 oz.—**Techtmann Industries, Inc., 828 N. Broadway, Milwaukee, Wis.**

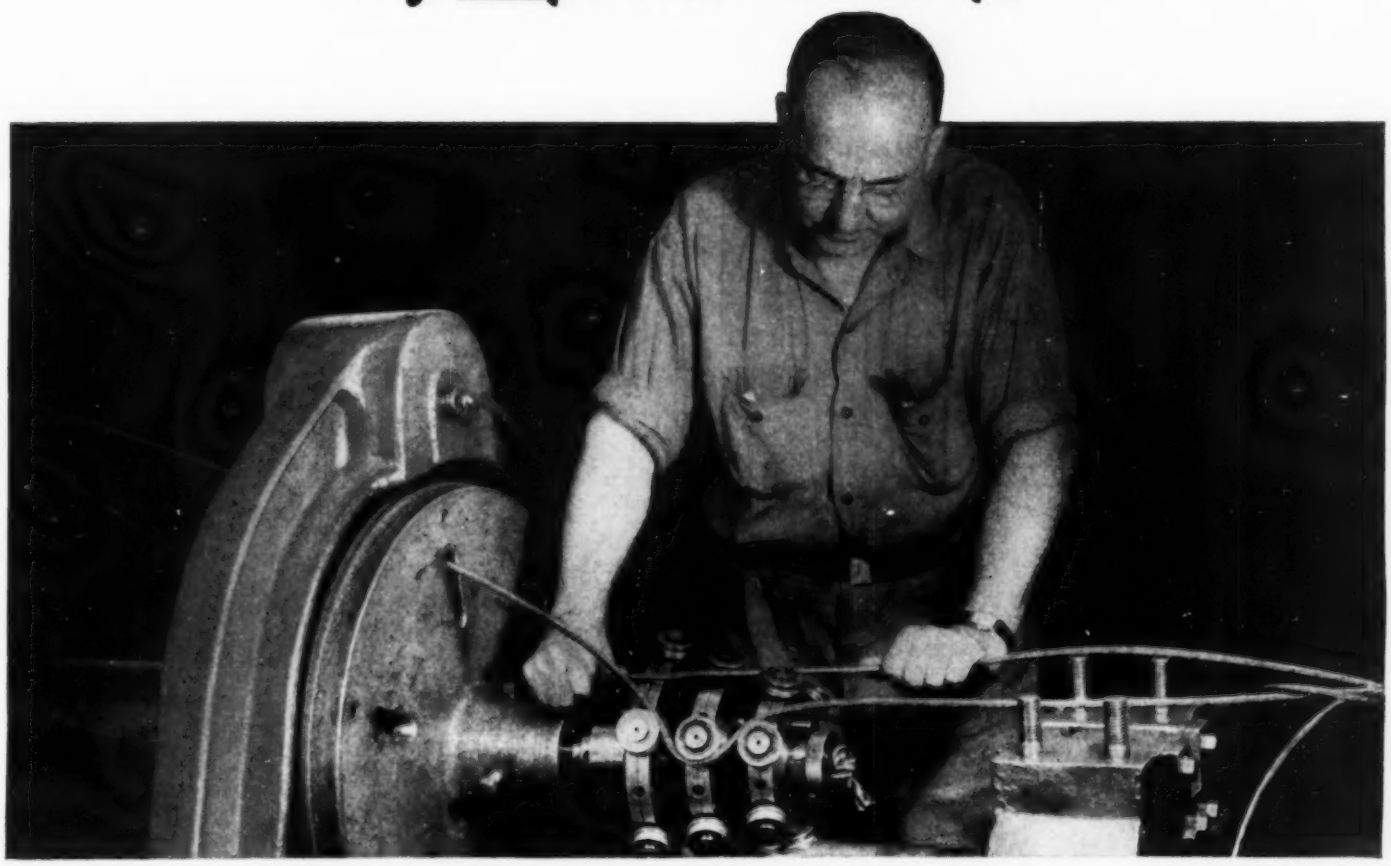
★ ★ ★

BENDING AND STRAIGHTENING MACHINES, in six sizes having capacities ranging from 50 to 400 tons, handles beams, channels, rails, shaftings, rounds, squares, forgings, structural sections or any other metal sections that require such service. Machines weigh from 3,800 to 55,000 lb. and can bend and straighten 5- to 24-in. beams. Eliminates wasteful process of heating beams or shapes, stak-



ing them out on a bending table and having work gangs hammer them to desired shape. Since work is performed cold, no furnace is required and operation is handled by one man. Continuously running ram with one bending block striking against the shape to be bent midway between two bearing blocks is operating principle of machine. Length of stroke of ram is quickly adjustable by handwheel positioned to give operator unobstructed view of work. Other construction details: Flywheel in anti-friction bearings; V-belt drive providing quiet operation and reducing shock load on motor; cast-steel gears and steel pinions, all having cut teeth with gear covers provided; high carbon steel forging cam shaft.—**Thomas Machine Manufacturing Co., Pittsburgh, Pa.**

"I've been 'setting up' Preformed ever since there was any Preformed Wire Rope"



"SETTING UP" is the initial step in manufacture which determines the final quality of Preformed Wire Rope.

Each and every strand of wire must be accurately and exactly pre-shaped on the preforming head the way it is to 'lay' in the rope. In this way added strength and life are built right into the heart of the rope. A mistake here could result in "heart failure" and irreparably bad performance.

It takes hands with the "feel" for setting up to do this exacting job . . . hands like Frank Mayer's which have been making Preformed for more than twenty years—in fact, ever since the birth of Preformed.

One reason you can always depend upon Upson-Walton LAYRITE Preformed Wire Rope is that every single foot of it is a *hand* controlled rope..controlled by the most experienced hands in the business.

It always pays to specify LAYRITE Preformed made by Upson-Walton — because LAYRITE is "set up" with consummate skill born of experience, for which there is never any satisfactory substitute.

Upson-Walton also manufactures wire rope clips, thimbles and sockets; tackle blocks, snatch blocks, turnbuckles and shackles

Established 1871

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

NEW YORK • PITTSBURGH • CLEVELAND • BUFFALO • CHICAGO

To move the maximum water in the minimum time, give it a whirl with a Self-Priming Centrifugal Pump. Centrifugal Reaction gives these pumps high-speed and high-capacity!

Novo improved the Self-Priming Centrifugal Pump by making it SELF-SEALING! The unique Novo Seal operates in a water-bath at discharge head pressure . . . reducing heat, wear, and loss of vacuum. Novo Self-Priming Pumps are compact, light-weight, rugged, and efficient. They are engineered to give the most service at the lowest cost.

Remember, for high-speed, high-capacity dewatering . . . use a Self-Priming Centrifugal Pump. For low-operating, low-maintenance cost . . . insist on a Novo Self-Sealing Self-Primer. Give it a whirl, you won't regret it.

Let us send you complete information about the complete line of Novo Self-Priming Centrifugal Pumps (1½" to 6")

Also a member of A.E.D.

NOVO ENGINE COMPANY LANSING, MICHIGAN

NOVO ENGINE COMPANY, 214 Porter Street, Lansing 5, Michigan

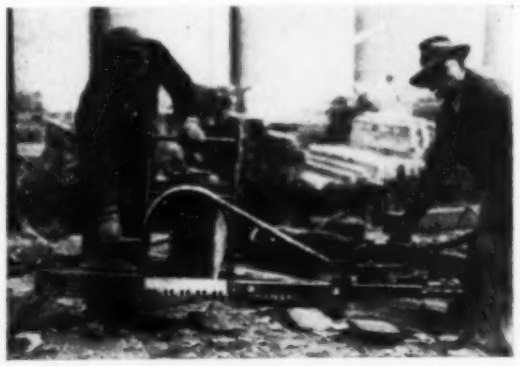
Please send me Bulletin No. 175A with full particulars about Novo Self-Sealed, Self-Priming, Centrifugal Pumps.

Name_____

Address_____

City_____ State_____

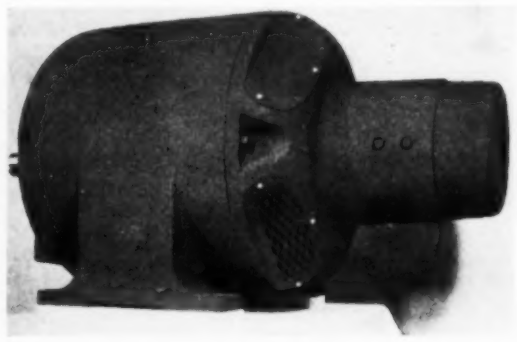
IN-BETWEEN SIZE PNEUMATIC SAW (18 in.) has helped solve manpower problems of many contractors, according to its makers, by enabling two men to do work formerly requiring services of six or eight on timber-cutting jobs. At 225 strokes per minute the saw is said to cut an 18-in. timber in



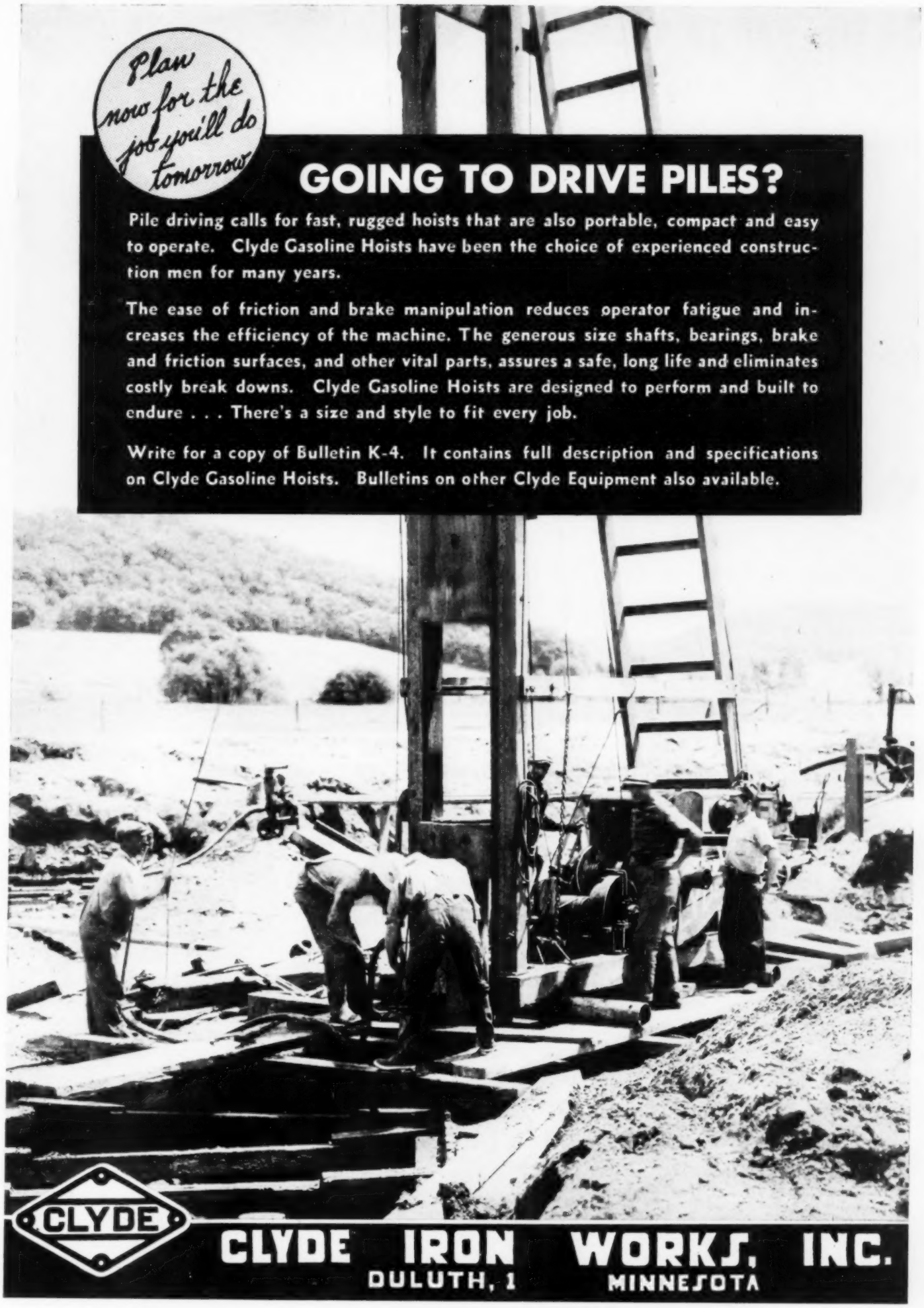
less than 1 min. Clamping device prevents arm jerking and uneven cuts and eliminates necessity of operator supporting saw's weight. Saws of this type were used extensively by D. D. Mullett, general contractors, in a timber clearing operation on Mosquito Creek dam near Warren, Ohio, which will create a reservoir 14 mi. long and 2 mi. wide to store water for the Warren and Youngstown steel mills.—**Davey Compressor Co., Kent, Ohio.**

★ ★ ★

REVOLVING FIELD GENERATORS, built in sizes 5, 10, 15 and 25 kw., 4-pole (1,800 rpm.) and in sizes 5, 10, and 15 kw., 6-pole (1,200 rpm.) can be furnished as independent two-bearing generators suitable for belt or coupling drive or as single bearing generators designed to fit standard SAE engine bell housing. These generators are conservatively rated and will carry 25 per cent overload without exceeding allowable temperature rise.



Voltage regulation is approximately 10 per cent with 2-cycle speed change. Stator and rotor made of No. 26 gage dynamo grade core plate sheet steel designed for low loss and high efficiency. Nickel cast-iron collector rings are molded into oil and acid resisting fibrous plastic base with generous extra cross-section to permit turning and polishing. Shafts machined and ground to close tolerance. Standard precision ball bearings. Ample capacity, long wearing brushes. Adjustable type brush holders. Cooling air of generator supplied from blower type cast aluminum fan which clamps on to shaft. Furnished with amortisseur or damper winding to facilitate parallel operation of two or more generators. Gray iron exciter frame cast integral with commutator end bell. Generator is excited by direct connected exciter at standard excitation voltage of 125 v. Available in all standard voltages and frequencies.—**Xato Engineering Co., Mankato, Minn.**



GOING TO DRIVE PILES?

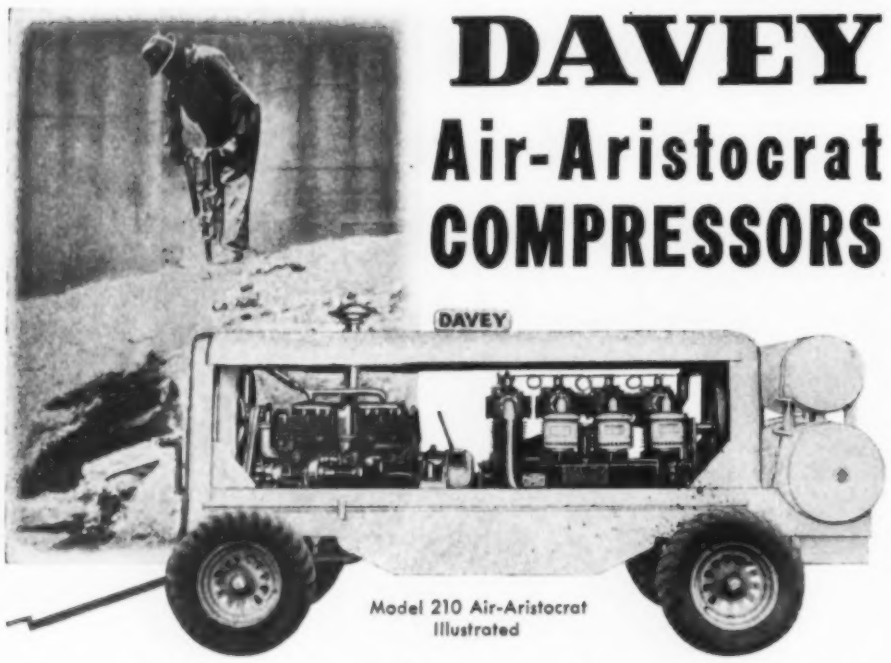
Pile driving calls for fast, rugged hoists that are also portable, compact and easy to operate. Clyde Gasoline Hoists have been the choice of experienced construction men for many years.

The ease of friction and brake manipulation reduces operator fatigue and increases the efficiency of the machine. The generous size shafts, bearings, brake and friction surfaces, and other vital parts, assures a safe, long life and eliminates costly break downs. Clyde Gasoline Hoists are designed to perform and built to endure . . . There's a size and style to fit every job.

Write for a copy of Bulletin K-4. It contains full description and specifications on Clyde Gasoline Hoists. Bulletins on other Clyde Equipment also available.

CLYDE

CLYDE IRON WORKS, INC.
DULUTH, 1 MINNESOTA



Model 210 Air-Aristocrat Illustrated

DAVEY Air-Aristocrat COMPRESSORS

. . . offer you these advantages!

✓ AIR COOLED — no water pumps to adjust, no jackets to drain or clean, no danger of freezing — lower service costs.

✓ ALUMINUM-ALLOY HEADS — again available in DAVEY compressors — allow heat dissipation three times as fast as cast iron, completely eliminating carbon formation on intake and discharge valves. No removal of heads to clean carbon, constant delivery of full air capacity.

✓ ENGINEERED FOR TROUBLE-FREE SERVICE — individual compressor cylinders . . . cylinders and heads separately removable . . . full force-feed lubrication . . . centralized control panel . . . heavy-duty industrial clutch (or fluid drive in Model 105-D) . . . electrically-welded chassis . . . skid- or wheel-mounted . . . available in 60, 105, 160, 210, and 315 cubic feet capacities.

DAVEY-ENGINEERED FOR RUGGEDNESS AND CONSERVATIVE SPEED

Some Distinguished Users of DAVEY Compressors

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Barker Bros. Construction Co., Denver, Colo.
Consolidated Gas Company, New York City
Lane Construction Co., Meriden, Conn.
Oklahoma Contracting Co., Dallas, Tex.
U. S. Forest Service, North Fork, Calif.

DAVEY Compressor Co. KENT • OHIO

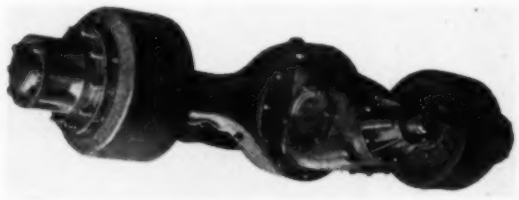
Davey Also Manufactures a Complete Line of Industrial Compressors, Heavy-Duty Power Take-Offs and Pneumatic Saws.

ARMY E NAVY

Write today for YOUR copy of the new Davey Catalog E-172

DEALERS IN PRINCIPAL CITIES

HEAVY-DUTY DOUBLE REDUCTION REAR AXLES intended for hauling on highways and city streets where permissible loads are more than 18,000 lb. per axle and designed for heavy loads and the increased torque capacity of modern high power engines, feature new interjacent pinion shaft location, midway between the conventional front mounted type where the pinion shaft is on the axle center line and the top mounted type where the pinion



shaft is considerably above the axle center line. This shaft location permits a nearly straight line propeller shaft drive on both long and short wheelbase trucks. Malleable iron axle housings have inserted heat-treated alloy steel sleeves. Differential carrier mounted on sloping front face of housing is readily removable for inspection. Differential bearing legs dowelled in housing to eliminate deflection under heavy torque load. Final drive consists of large diameter hypoid bevel gear and pinion for first reduction and wide-face helical gear and pinion for second reduction. Both gear sets are rigidly mounted on large capacity Timken roller bearings. Range of five gear ratios, with total reductions possible from 6.42 to 9.83 to 1, is available to meet all operating requirements. Track on both axles is 72 in., with 11.00x20-in. tires on dual disk wheels with 12¾-in. spacing.— **The Timken-Detroit Axle Co., Detroit, Mich.**

When There's No Time for Breakdowns It's Time to Get a Gorman-Rupp Pump

Today, when time is the essence, you need a Gorman-Rupp Self-Priming Centrifugal Pump more than ever. There is not a quitter among them. The water passage has the same area as the suction hose. Muck, gravel, cinders — you simply can't clog them because solids cannot accumulate. There is no recirculation orifice to clog — no shut-off valve to jam — no hand priming regulator. There isn't a self-priming centrifugal pump made that will outwork a Gorman-Rupp in gallonage or continuous hours. Gas engine or electric motor driven. Capacities up to 125,000 GPH. There is a type and style to fit your every requirement. Stock for immediate delivery in 100 principal cities.

THE GORMAN-RUPP COMPANY, MANSFIELD, OHIO

GORMAN-RUPP Self-Priming Centrifugal Pumps

MAKE ONE BEARING
OUTLIVE TWO!

One plant that regularly had two or three bearing failures a month writes us, "We have had only *one* bearing failure in five years since using LUBRIPLATE"... another writes, "Pulled our ball bearing temperatures down from 170° to 130°F"... still another, "If LUBRIPLATE cost $1.50 a pound we could still afford to use it."

BALL BEARING LUBRIPLATE

Over a period of years this outstanding grease type lubricant has reflected superior performance on the general run of ball and roller bearings operating under normal conditions at speeds up to 5,000 R. P. M. and temperatures from zero to 300 degrees F.

Long time users of BALL BEARING LUBRIPLATE everywhere attest to its superiority in providing cool and quiet operation – protection against corrosion, and of major importance, substantial reduction in bearing replacement costs.

Write today for your copy of Bulletin No. 1-43 containing valuable data on the lubrication and care of anti-friction bearings.

LUBRIPLATE DIVISION
FISKE BROTHERS REFINING COMPANY
Newark, N. J. **SINCE 1870** Toledo, Ohio
DEALERS FROM COAST TO COAST

7 FACTS ABOUT LUBRIPLATE

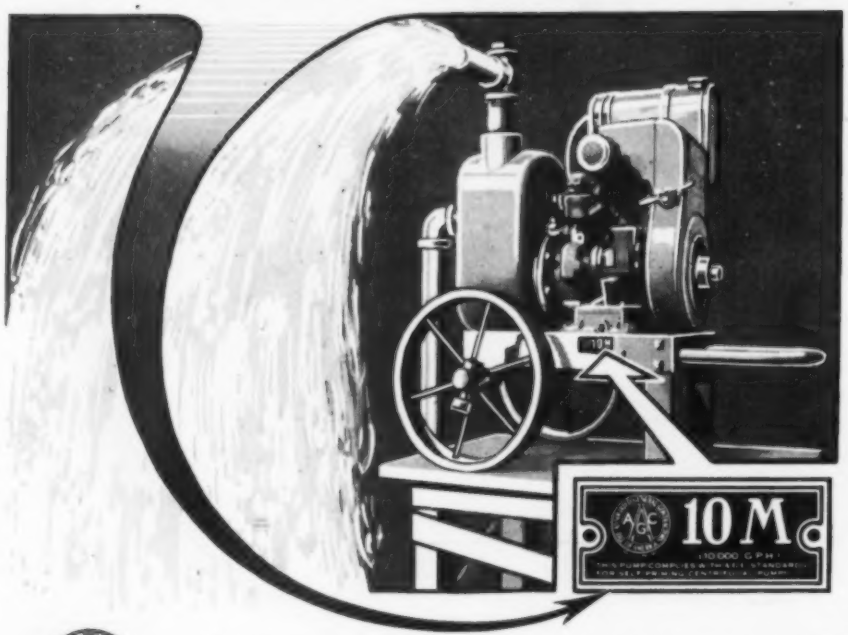
1. *LUBRIPLATE produces an ultra-smooth, wear-resisting bearing surface.* 2. *LUBRIPLATE reduces friction, thus lowering maintenance and power costs.* 3. *LUBRIPLATE resists rust, corrosion and pitting.* 4. *Most LUBRIPLATE products are white. LUBRIPLATE assures clean lubrication.* 5. *LUBRIPLATE outlasts ordinary lubricants many times.* 6. *LUBRIPLATE is economical—a little goes a long way.* 7. *LUBRIPLATE is available in fluid and grease types for every need.*

LUBRIPLATE

THE MODERN LUBRICANT *that Arrests Progressive wear*

"Its the Film"

PROTECT YOURSELF



You cannot afford to take chances when buying a pump. Look for the AGC rating plate before you buy. The rating plate is your guarantee that the pump will deliver its full rated capacity.

CONTRACTORS PUMP BUREAU

BARNES MANUFACTURING CO. Mansfield, Ohio
CONSTRUCTION MACHINERY CO. Waterloo, Iowa
MARLOW PUMPS Ridgewood, N. J.
C. H. & E. MANUFACTURING CO. Milwaukee, Wis.
THE GORMAN-RUPP CO. Mansfield, Ohio
HOVO ENGINE CO. Lansing, Mich.
CHAIN BELT COMPANY Milwaukee, Wis.
JAEGER MACHINE CO. Columbus, Ohio
STERLING MACHINERY CORP. Kansas City, Mo.

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"CLEVELANDS"
Fast – Flexible – Rugged
MEET FULLY YOUR DITCHING REQUIREMENTS for - - - -

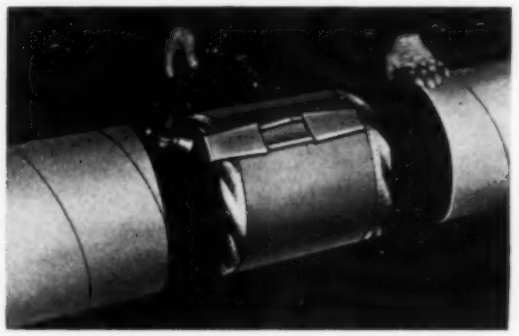
- - - Gas, Oil, Water Lines — Air Fields — Sewers — Drain Tile— Telephone and Telegraph Conduits and Building Foundations —

Finely balanced—correctly designed—powerful—rugged—fast—easily maneuverable on full crawler mounting—and strongly resistant to wear and abuse, "CLEVELANDS" represent the utmost in ditching economy and efficiency. That's why they are delivering Top Performance on many military projects and civilian jobs.

"CLEVELAND" Equipment includes: — Ditchers (Wheel and Ladder Type in several models) Side Boom Backfillers — Tampers — Pipe Cranes — etc.

THE CLEVELAND TRENCHER COMPANY
20100 ST. CLAIR AVE "Pioneer of the Small Trencher" CLEVELAND 17, OHIO
"CLEVELANDS" Save More . . . Because they Do More

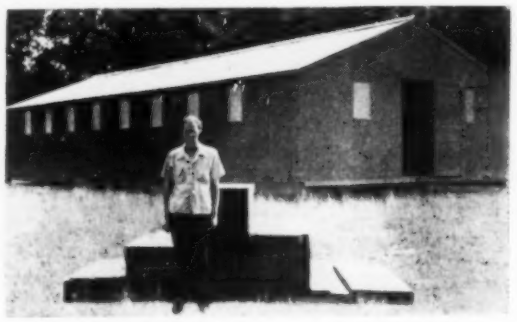
SIMPLIFIED DRIVE COUPLER is said to speed field assembly of Ric-wiL prefabricated insulated pipe conduit, eliminating need for skilled workmen and reducing installation time. Shipped to the job in 21-ft. sections, completely prefabricated with pipe or pipes, insulation and aligning pipe supports. Ends of helical corrugated conduit are expanded smooth at the factory, removing corrugations a distance of 3 in. Bare pipe extends beyond ends of conduit for 3 more inches. After pipe has been coupled or welded and insulation applied over exposed portions, smoothed ends of conduit are coated with waterproof sealing cement. A heavy-gage split connector sleeve then is slipped over the opening. Clamps are driven on to wedge-shaped channels over lapped joint, quickly making



a strong, watertight mechanical coupling. Where welded closure is required, cement is omitted and ends of sleeve lap-welded to conduit after clamps have been applied. Clamps then are removed and longitudinal seam lap welded. For extra strength, clamps may again be driven on to channels after weld is made. When conduit coupling is completed, an asphalt blanket is applied with heat over the entire closure area, fuses with factory applied asphalt, assuring uniform protection at all points. Accessories for the complete system—including expansion loops, elbows, tees, anchors and reducers are prefabricated and equipped with the same drive coupler for assembly with conduit sections. Conduit is adaptable to underground, surface or overhead installation.—**The Ric-wiL Co., 1572 Union Commerce Bldg., Cleveland, Ohio.**

★ ★ ★

PLYWOOD PLASTIC METAL PANELS, combining plywood, plastics (used as an adhesive) and light metal of paper thickness, retaining the outstanding characteristics of both, and known a "Armorply," are possibilities for post-war use in construction of prefabricated houses, garages, barracks, farm



buildings and warehouses. Advantages: (1) Serve three purposes, framework, sheathing and exterior siding or roofing; (2) can be factory fabricated in sizes required and advantageously shipped to assembly point as they occupy little space and are relatively light weight; (3) time and labor-saving because the one fabricated material serves as framing, sheathing and exterior siding and roofing. —**United States Plywood Corporation, 616 W. 46th St., New York 19, N. Y.**

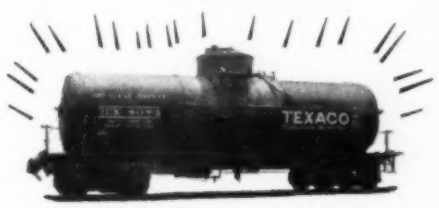
HOT OIL . . .

. . . MAKES FAST WORK OF THAT OILING PROJECT

THE tank-car on the siding is the starting point for fast work on any oiling project. The quicker you get the oil or asphalt up to application temperatures and flowing into the distributors — the faster your road crews can get going.

With a Cleaver-Brooks tank-car heater you have hot dry steam flowing to the car coils from a cold start in 20 minutes or less. And you can keep going all day with the least work and bother because a Cleaver-Brooks tank-car heater asks less in fuel and water. The famous and exclusive four-pass flue travel means low fuel consumption; the turbine type condensate return system cuts water loss — every drop of condensate goes back to the heater under pressure. . . . Built for full capacity — full-time work — Cleaver-Brooks tank-car heaters will give you the most in production hours on the job. Wherever in service, Cleaver-Brooks are usually given the tough jobs because of their known reliability. . . . Write today — get full information from Cleaver-Brooks — the pioneers and originators of tank-car heaters and bituminous boosters.

GET HOT OIL— FAST — WITH LESS WORK — FUEL— WATER



Not just a "boiler on wheels" but a rugged, compact, highly perfected steam generator built by specialists in steam generating equipment.

★

The only tank-car heater with the fuel-saving four-pass flue travel construction. No water problem — full condensate recovery and return to heater under pressure.

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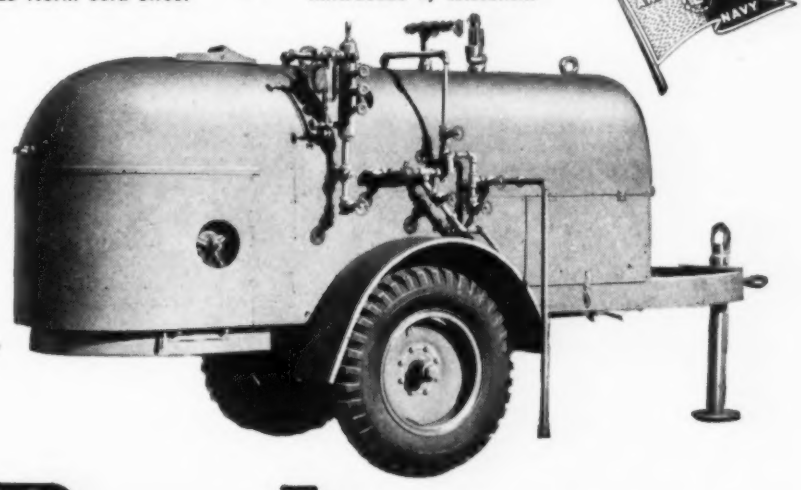
An all-purpose unit—provides steam wherever and whenever needed — for heating, thawing, cleaning.

CLEAVER-BROOKS COMPANY

5125 North 33rd Street • Milwaukee 9, Wisconsin



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PIONEERS AND ORIGINATORS OF

TANK CAR HEATERS . . . BITUMINOUS BOOSTERS . . . AUTOMATIC STEAM PLANTS

Sonotube

LAMINATED FIBRE TUBING FOR

Pier and Column Forms

SAVES MONEY, LUMBER, LABOR

Successfully used up to 10′ for inside columns and up to 7′ for foundation piers.

6 Standard Sizes

Up to Twenty-Four Feet Long

INSIDE DIAMETER					
8″	9″	10″	11¼″	12″	13½″
SQUARE INCHES					
50.26	64	78.54	100	113.1	144

Smaller sizes available.

IMMEDIATE DELIVERY

SONOTUBE has long since passed the experimental stages and is now widely accepted for pier and column forming work. Cut to exact lengths on the job Sonotubes save time, money and materials.

Write for delivered prices

SONOCO PRODUCTS COMPANY

HARTSVILLE, S. C. MYSTIC, CONN.

ROCKINGHAM, N. C. DARWOOD, N. J. LOWELL, MASS.

WPB Chairman Favors Speedy Start for *Construction*

AT A MEETING LAST MONTH with Donald M. Nelson, chairman of the War Production Board, a construction industry committee brought together by the Chamber of Commerce of the United States received assurance that WPB would take steps to insure a speedy start for construction during the critical transition from war to peace. The committee emphasized the need of prompt resumption of construction as labor and materials become increasingly available and pointed out that the construction industry realizes its responsibility as one of the first industries which must get started to sustain employment as war work eases off.

Positive stimulation will be needed to

(Continued on page 130)

DO YOU

Operate Diesels?

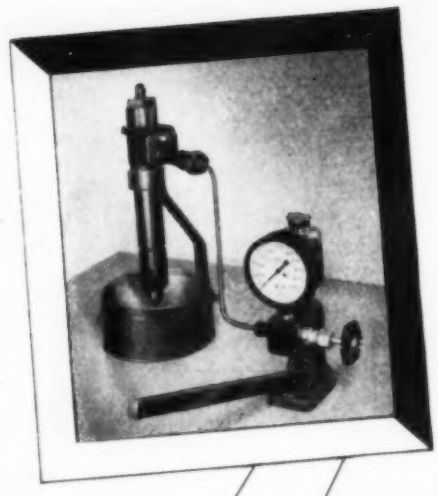
Then here's a timely wartime tip on how you can guard against engine overheating, increased oil consumption, loss of power, scored cylinders. Keep the cooling systems of your Diesel or gas engine units SCALE-FREE by using FAST - WORKING Oakite Compound No. 32. You will find it removes deposits THOROUGHLY without harming basis metal. Free, 28-page illustrated manual gives complete, helpful data. Write for YOUR copy NOW!

OAKITE PRODUCTS, INC.

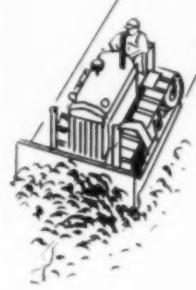
24G Thames St., New York 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* CLEANING



ADECO



NOZZLE TESTER

KEEP DIESEL ENGINES RUNNING AT PEAK EFFICIENCY

With this sturdy, portable, lightweight Adeco Nozzle Tester, any mechanic can easily make quick, accurate tests on injector opening pressure, spray pattern, etc. and detect stuck needle valves and leakage around valve seats. Adeco advantages have made this America's most widely used nozzle tester. Tests both large and small injectors, on bench or engine. Avoids costly delays and possible damage to engine. Keeps diesels operating at peak efficiency.

Write for new illustrated bulletin.

ADECO

AIRCRAFT & DIESEL EQUIPMENT CORPORATION

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CHICAGO 40, ILLINOIS

YOUR LINK-BELT SPEEDER HAS GONE TO WAR ON FRONTS ALL OVER THE WORLD

FROM DARKEST AFRICA

TO THE ALASKA HIGHWAY

9861

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO 9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

(Continued from page 128)

get construction work in process, the group told Mr. Nelson. It expressed its conviction that major reliance should be placed on the industry and on construction users to decide which work should be started first. Where projects are ready to start and where men and materials become available, the committee pointed out that priorities assistance and other necessary encouragement should be given to enable the work to get under way promptly.

Increase Civilian Jobs

Such a procedure, the committee said, would require a minimum of regulation or direction from Washington. If combined with the provision for the manufacture of needed equipment, the committee held it would insure a morale-building increase in civilian jobs during the transition period. Because the pipe lines of building equipment are nearly empty, it will be essential, the committee declared,

(Continued on page 132)

POWER-- Speed

TO LIFT THE HEAVIEST LOADS SAFELY, EASILY

DUFF • NORTON JACKS

ON every job be sure you use Duff-Norton Jacks to help with the heavy lifting, lowering, pushing and pulling. Duff-Nortons are husky and powerful—built to give you fast, easy operation with safety and dependability every time.

CATALOG 202 is yours on request. Just off the presses with full data on the complete Duff-Norton line. Write for your copy today.

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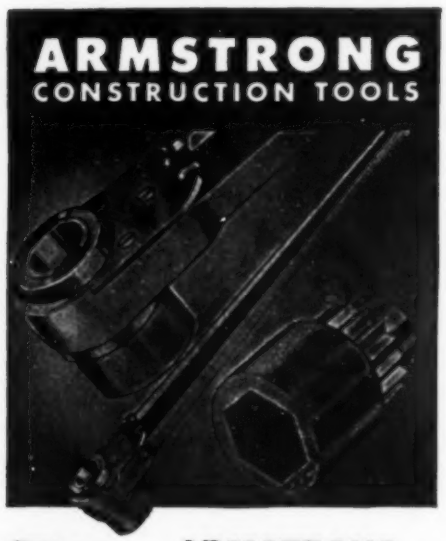
Canadian Plant: COATICOOK, QUEBEC • Representatives in Principal Cities

ARMSTRONG CONSTRUCTION TOOLS



ARMSTRONG

DROP FORGED CONSTRUCTION RATCHETS

The ARMSTRONG Reversible Ratchet Construction Wrenches are made of steel thruout—the Ratchets are drop forged, the Nut Socket machined from special analysis bar steel. All parts except the handle are hardened. The spindle of the Ratchet is of "wide open" design—permits bolt to pass thru the Ratchet so that nuts can be run any distance along bolt and securely set with one setting. 24" or 36" Ratchets take square or hexagonal sockets for nuts of from 1" to 2⅛" dia. or 1⅛" to 3⅛" dia., respectively.

Write for Catalog

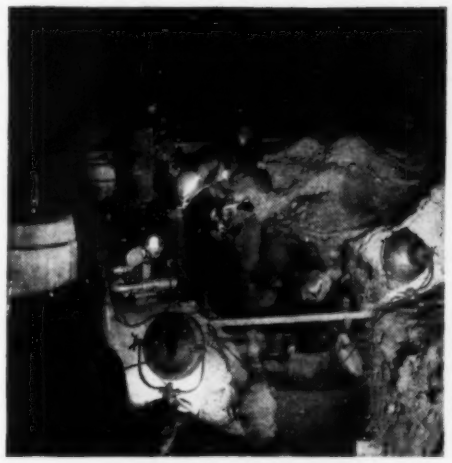
ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
334 N. FRANCISCO AVE. CHICAGO, U.S.A.
Eastern Warehouse & Sales: 199 Lafayette St., New York

Strictly ~~on~~ off the Level!

Our Army Tanks are built for the high seas of dry land . . . up, over and down . . . up, over and down. The equipment that goes into those tanks must be able to operate perfectly no matter how rough the going.

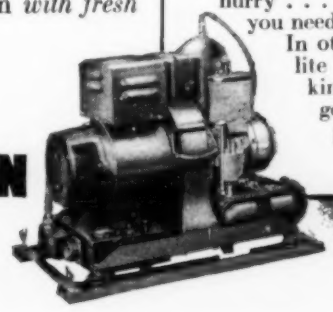
Homelite gasoline-engine-driven Generators are used in M3 and M4 tanks for supplying electricity for radio, for gun turret operation and for battery charging. And no matter whether the tank is sticking its nose up in the air or taking a dive into a hole . . . *regardless of the angle* . . . the Homelite runs without trouble.

You see, a Homelite uses no crankcase oil . . . no oil sump that must be kept level and free from sludge. The oil is mixed right in with the gasoline in the Homelite's fuel tank . . . assuring a penetrating, complete and thorough job of lubrication *with fresh clean oil* at any angle.



For operating floodlights or portable electric tools on emergency or maintenance work, you want a light, easily portable generator that doesn't have to be set up on a level floor for perfect operation. You want a generator that can be set up anywhere in a hurry . . . at any angle . . . any place you need a power unit.

In other words you need a Homelite Portable Generator . . . the kind that performs like a real, good soldier in the roughest going tanks.



HOMELITE CORPORATION

PORT CHESTER, NEW YORK

REINFORCED HIGHWAYS CONTINUE TO SHOW SUPERIORITY IN PERMANENCE AND LOW MAINTENANCE. EVER-GROWING WHEEL LOADS REQUIRE HIGHWAYS BUILT TO WITHSTAND INCREASED STRESSES. STEEL REINFORCEMENT PROVIDES THE ONLY INSURANCE FOR LONG AND USEFUL SERVICE OF OUR NATION'S PAVEMENTS.

Specify LACLEDE'S PAVING STEELS

LACLEDE STEEL COMPANY

ST. LOUIS, MISSOURI

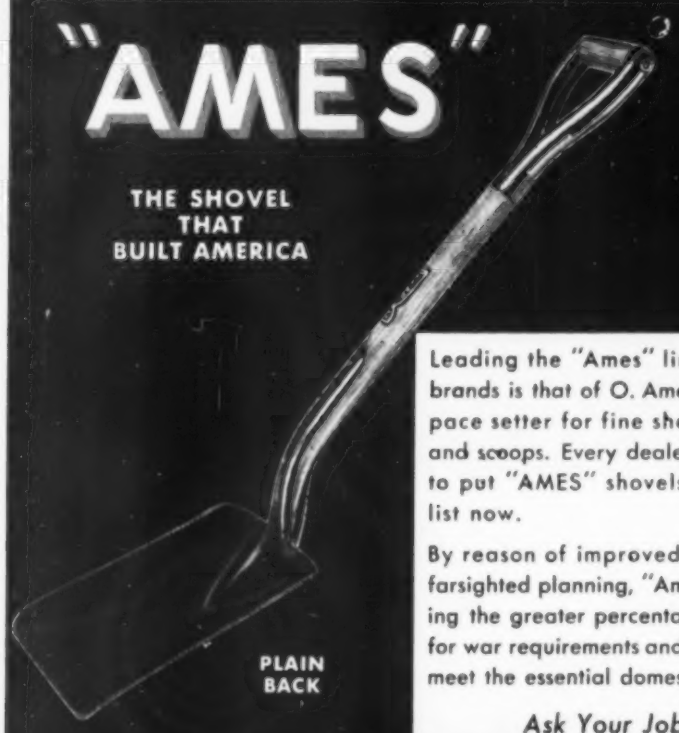
KNOXALL • RED EDGE • BRONCO • PINNACLE • O. AMES • OPTIMUS

PEERLESS • FAVORITE • TWO STAR • HUSKY • RAM

PONY • COLT • CARTER • MONONGAH • THREE STAR

"AMES"

THE SHOVEL THAT BUILT AMERICA



PLAIN BACK

Leading the "Ames" line of famous brands is that of O. Ames, the pioneer pace setter for fine shovels, spades and scoops. Every dealer will do well to put "AMES" shovels on his *must* list now.

By reason of improved methods and farsighted planning, "Ames" is supplying the greater percentage of shovels for war requirements and continuing to meet the essential domestic demand.

Ask Your Jobber

AMES Since 1774

Parkersburg, W. Va. AMES BALDWIN WYOMING CO. North Easton, Mass.

SHOVELS • SPADES • SCOOPS • FORKS • HOES • RAKES • POST HOLE DIGGERS • AGRICULTURAL HANDLES

(Continued from page 130)

to start filling them at the earliest practicable time to encourage the start of construction work.

Several months would be saved in the resumption of all types of construction work, the committee said, if the industry could be given assurance that necessary equipment for building and other structures, as well as building materials, could be produced and permitted to flow through industry channels as rapidly as war requirements permit.

Industry Committee Membership

The industry committee included representatives of building materials and equipment manufacturers and suppliers, as well as engineers, architects, contractors and home builders. Allen J. Saville, representing the American Society of Civil Engineers, is chairman of the committee. Other members of the group are: Raymond J. Ashton, president, American Institute of Architects; Wilson Compton, secretary-manager, National Lumber Manufacturers Association; Robert P. Gerholz, president, National Association of Home Builders; Norman P. Mason, regional vice president, National Retail Lumber Dealers Association; William Muirhead, president, Associated General Contractors of America; Douglas Whitlock, president, The Produeers' Council.

The committee was chosen from the Chamber's Industry Advisory Group, of which E. P. Palmer is chairman. Mr. Palmer also is chairman of the Chamber's Construction and Civic Development Department Committee. F. Stuart Fitzpatrick, manager of the Construction and Civic Development Department, is secretary of the construction industry committee.

★ ★ ★

East Coast to Offer Best Post-War Market For Industrial Construction

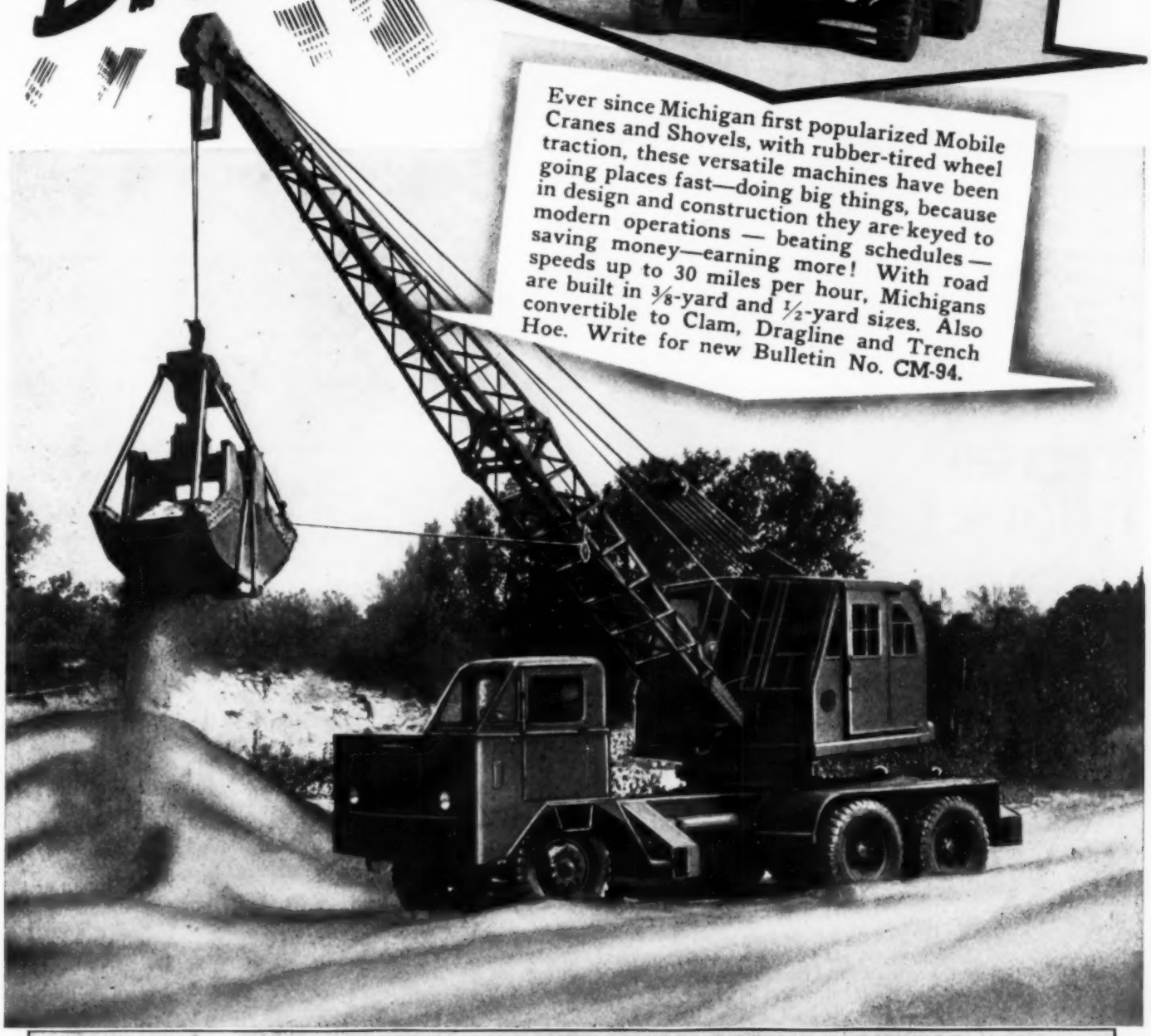
THE EAST COAST will offer one of the Nation's best domestic markets for industrial construction in the years following the war, according to a post-war study announced recently by Harold K. Ferguson, president of The H. K. Ferguson Company, industrial engineers and builders of Cleveland and New York.

The study is one of many now being

(Continued on page 134)

Going Places to do BIG things

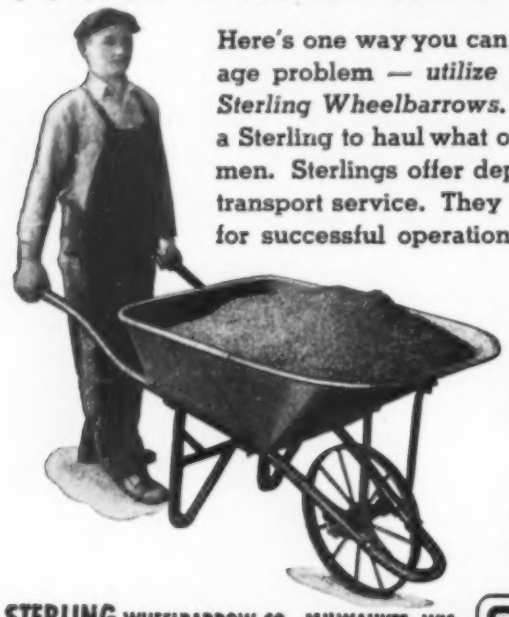
Ever since Michigan first popularized Mobile Cranes and Shovels, with rubber-tired wheel traction, these versatile machines have been going places fast—doing big things, because in design and construction they are keyed to modern operations — beating schedules — saving money—earning more! With road speeds up to 30 miles per hour, Michigans are built in 3/8-yard and 1/2-yard sizes. Also convertible to Clam, Dragline and Trench Hoe. Write for new Bulletin No. CM-94.



MICHIGAN
POWER SHOVEL COMPANY
BENTON HARBOR, MICHIGAN

5 Men

. . . or 1 man and a STERLING



Here's one way you can solve that manpower shortage problem — *utilize the load-carrying ability of Sterling Wheelbarrows.* It only takes one man and a Sterling to haul what otherwise would require five men. Sterlings offer dependable, low-cost, material transport service. They do not require skilled labor for successful operation. And they last a lifetime.

Sterlings are well-known for their balanced, easy wheeling qualities; sturdy steel tray, all welded (no rivets); smooth inside surface; top edge reinforced by continuous butt-welded rod; V-shaped tray braces.

●

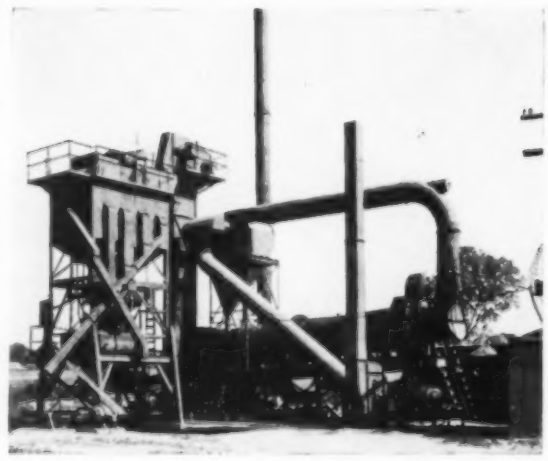
If you need Sterlings today—write us. We cannot guarantee deliveries, but we'll do the best we can to take care of your requirements.

STERLING WHEELBARROW CO., MILWAUKEE, WIS.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

INCREASED EFFICIENCY *and* PRODUCTION in *Asphalt Mixing*—



☆ Compactness and a substantial increase in dryer capacity and efficiency are among the results accomplished by refinements in design in this recently completed H & B Portable (PA-30) Asphalt Plant. A larger fan is used, and the duct system from the dryer to the dust collector and from dust collector to the exhaustor has been redesigned. The new horizontal cyclone dust collector is more compact and efficient. The exhaust fan, motor which drives the dryer, and the speed reducer are combined in one completely assembled unit which is mounted on a separate platform. This decreases length of the dryer unit and greatly facilitates handling. A new type of screen reduces the overall height of the plant considerably, without reducing the bin capacity.

Further information concerning this plant will be furnished on request.

HETHERINGTON & BERNER Inc.

735 Kentucky Avenue • Indianapolis 7, Indiana

Hetherington & Berner

(Continued from page 132)

conducted by the organization to determine future markets and to improve its services in the industrial engineering and building field when wartime restrictions on construction are lifted.

Activity in East

"The Eastern section of the United States will be the scene of great activity in industrial engineering and building," Mr. Ferguson said. "Our research the last several months has provided us with a number of logical reasons for believing this.

"For security purposes, the Atlantic seaboard has been neglected in the war construction program. Generally, there have been few new plants in this area, although Eastern manufacturers have been called on to operate new facilities all over the country.

"To attempt to tell now what will happen to all of the new plants built in isolated locations—and justifiably so in most cases—would be pure folly. We do, however, know basic requirements of industry and we can reach a reasonable conclusion about new construction that seems likely in view of past experience.

Program of Consolidation

"We believe," he continued, "that industries will embark on a program of consolidation, centered around established plants, immediately the war is over."

Mr. Ferguson explained that manufacturing organizations usually must be concentrated at one location for profitable operation. Because of increased post-war markets in the East, a large number of these programs for concentration likely will be conducted at sites in this territory.

"The consolidation program will not require many entirely new plants," he said, "but it will be necessary to construct new buildings at some sites, expand old buildings at others, change, remove or relocate processing and manufacturing equipment—anything necessary to restore a normal, peacetime operation. The spectacular part of building will be missing, although the volume of work should hold up well over a comparatively long period of time."

Mr. Ferguson, originator of the "standard" factory building—a structure built from stock plans to save cost and time—believes the East will also furnish sites for a number of entirely new plants to make products that are developed as a result of the war.

Increased Plastic Manufacture

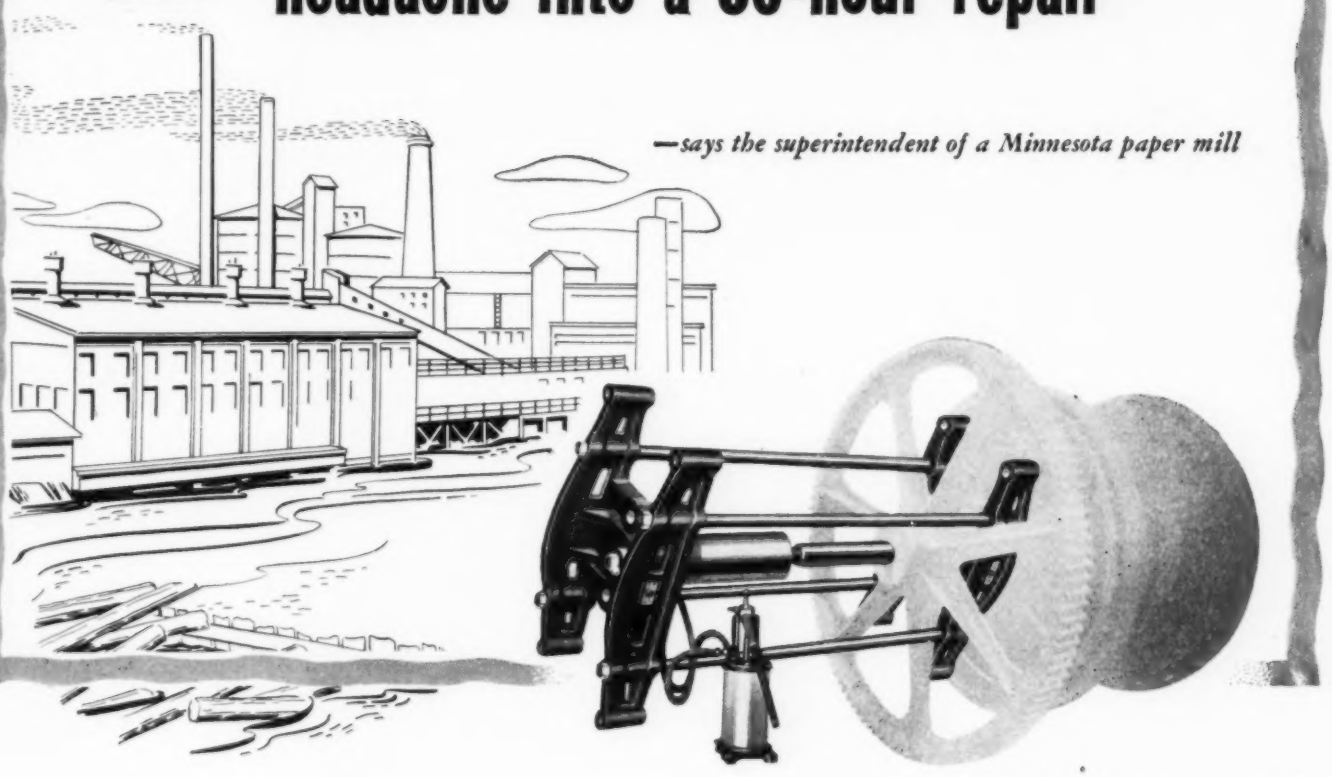
"Undoubtedly, new plants will be constructed for the manufacture of plastics, synthetics and various other warborn products," he said. "The consumer market will materially affect the location of many of these facilities, and the East

(Continued on page 136)

NO. 18 OF A "READY-WITH-A-RODGERS" SERIES

"... your press turned a 10-day headache into a 36-hour repair"

—says the superintendent of a Minnesota paper mill



THE PROBLEM . . . removing and replacing a broken drive gear.

"Our Rodgers Universal Hydraulic Press enables us to make this repair on one of our continuous process machines and get it back into operation in something like 36 hours, whereas it usually took about 10 days before we had your equipment. It had meant burning off gears and sending the work out, tying up our entire production line. Your Rodgers has proved invaluable for this one purpose alone, although we wouldn't be without it for its uses on many other jobs."

There's a Rodgers Press for YOUR *job . . . write today for full information!*

Uses for the

RODGERS UNIVERSAL HYDRAULIC PRESS

- Gear Pulling
- Wheel Press Work
- Jacking Pipe or Tile
- Erecting Machinery
- Relocating Machinery
- All-Purpose Jack

HYDRAULICS Rodgers KEEP THE WORLD MOVING

If It's a Rodgers, It's the Best in Hydraulics

Rodgers

HYDRAULIC, Incorporated

St. Louis Park, Minneapolis 16, Minnesota

(Continued from page 134)

Coast, particularly the New York area, is a 'natural' in that respect."

He said he also knew of many manufacturers of civilian commodities who are awaiting the day they can construct new plants, but have been restricted because of War Production Board limitations. He added that the New York area is particularly affected in this instance.

Maintenance Construction

Another source of industrial engineering and building, according to the Ferguson study of the Eastern market, will be "maintenance" construction. Little new work has been done at Eastern plant sites, the report said, whereas facilities usually have been in operation on a 'round the clock basis. A great deal of work will be necessary to place them in good repair, a condition, which in many cases could not be alleviated because of scarcity in building materials.

Mr. Ferguson said that studies are being made to determine the building outlook in several branches of industry, and that findings would be announced as soon as they are made available.

This Native is Carrying War Supplies Wrapped in SISALKRAFT

IN STEAMING JUNGLES and ice-bound arctics, war goods protected by SISALKRAFT are arriving in usable condition! Thus, weatherproof, tear-resistant, scuff-proof SISALKRAFT, normally used for concrete curing, is helping the war effort.

Directly exposed to wind, rain, ice, sleet, salt water and rough handling, SISALKRAFT is taking more abuse in one trip than it would get when used a dozen times for concrete curing. The strength and waterproofness you need for concrete curing are the properties that enable SISALKRAFT to do such an outstanding war job.

Put SISALKRAFT First in Your Postwar Plans — for dependable concrete curing!

To prevent rapid evaporation of moisture from newly poured concrete — to protect it from "drip" and debris — and for protection from frost — SISALKRAFT has established an unmatched record for low-cost, dependable performance. Used again and again for concrete curing, SISALKRAFT Blankets are finally used to protect subgrade and materials stored in the open. The low cost of SISALKRAFT is appreciated by contractors doing concrete work. It has an unequalled record of nearly 25 years of satisfactory service.

Put SISALKRAFT first on your list of postwar purchases!

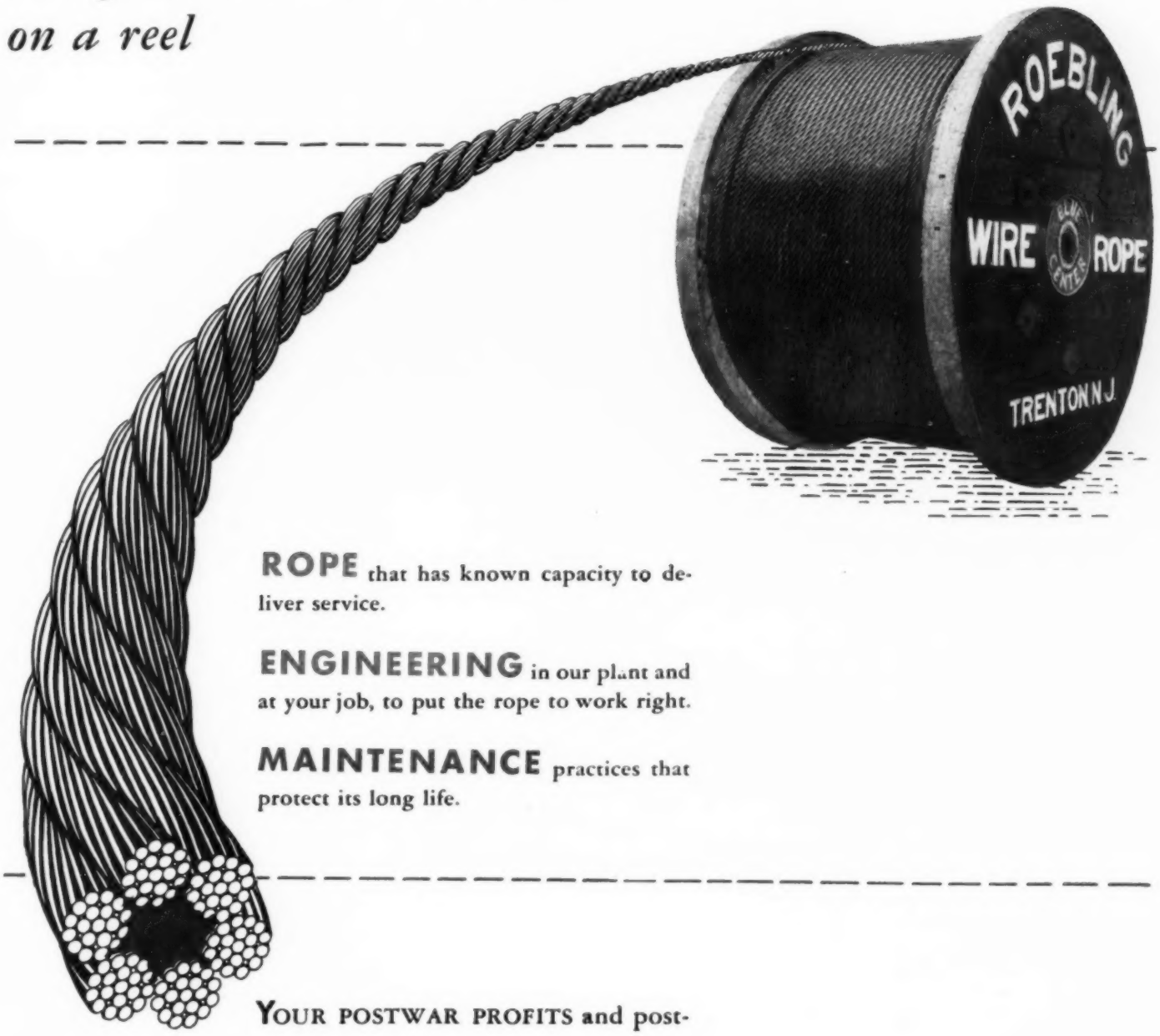
THE SISALKRAFT CO. 205 W. WACKER DRIVE · CHICAGO 6, ILL. NEW YORK · SAN FRANCISCO · LONDON · SYDNEY

Manufacturers of SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

Light enough to handle . . heavy enough to "take it". These HIGHLY PORTABLE CMC's have proven their durability and sturdiness on important jobs all over the world. They are "first choice" Mixers in peace or war. All standard sizes. Get information.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa
Mixers • Pumps • Hoists • Batching & Placing Equipment • Saws • Carts • Barrows

When you say, **"Make it ROEBLING** *'Blue Center'" you buy a lot of things that can't be wound on a reel*



ROPE that has known capacity to deliver service.

ENGINEERING in our plant and at your job, to put the rope to work right.

MAINTENANCE practices that protect its long life.

YOUR POSTWAR PROFITS and postwar jobs will depend in part on operating rope-rigged equipment at lowest possible cost. You can leave that part to Roebling.

JOHN A. ROEBLING'S SONS COMPANY, Trenton 2, New Jersey
Branches and Warehouses in Principal Cities

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PACEMAKER IN WIRE PRODUCTS

WIRE ROPE AND STRAND • FITTINGS • COLD ROLLED STRIP • SUSPENSION BRIDGES AND CABLES • AIRCORD, SWAGED TERMINALS AND ASSEMBLIES • AERIAL WIRE ROPE SYSTEMS ELECTRICAL WIRES AND CABLES • ROUND AND SHAPED WIRE • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS WIRE CLOTH AND NETTING

ON ROGERS TRAILERS

EXPERIENCE *builds 'em*
PERFORMANCE *sells 'em*

GETTING there "fustest with the mostest" as one early American General aptly phrased it, is battle strategy that really conquers!

In the lightning speed of mechanized warfare tanks ride "Pick-A-Back" to battle on ROGERS TRAILERS so their fighting capacity is unimpaired. Special ROGERS TRAILERS retrieve disabled tanks so they can be repaired and rushed into battle again.

ROGERS TRAILERS are doing a real war job at home and abroad. New models which will be available to industry when war contracts are completed will be even better-engineered and more efficient than their predecessors.

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MODEL 23 ILLUSTRATED
IMMEDIATE DELIVERY ON ALL MODELS

10 REASONS WHY MASTER VIBRATORS PLACE CONCRETE FASTER..BETTER ON ANY JOB!

Master Gas or Electric High Speed Concrete Vibrators are built for high frequency vibration and maintain constant speed under full load to make possible: (1) low cost, high strength concrete; (2) better bond to steel or successive layers; (3) greater density and uniformity; (4) reduced shrinkage and cracking; (5) minimum absorption, greater water tightness; (6) improved compression and flexural strength; (7) drier and leaner mixtures; (8) earlier removal of forms; (9) placing in difficult positions and elimination of hand tamping and spading; (10) minimum finishing and patching, etc.

WRITE TODAY FOR COMPLETE DETAILS

There are Medium Duty, All Purpose or Heavy Duty Master High Frequency Constant Speed Vibrators in Gas or Electric Models to meet every need . . . together with a complete line of Concrete Surfacing Attachments and High Speed Tools.

Write for Bulletin No. 528.

ACCEPTED AS STANDARD EQUIPMENT BY CONTRACTORS & ENGINEERS THROUGHOUT THE WORLD

Master High Frequency Constant Speed Concrete Vibrators are no experiment. *They have been proved on every type of construction job for many years. Even under the most adverse operating conditions they provide constant operation over long periods of time.*

MASTER VIBRATOR COMPANY
Dayton 1, Ohio • Distributors throughout United States and Canada

Products Include: Concrete Vibrators Gas or Electric Surfacing Attachments, High Speed Tools • Vibratory Concrete Finishing Screeds • Rotary Concrete Floor Finishing Machines • Portable Gas Electric Generator Plants, 500 Watt to 17000 Watt, Voltage Regulators and Portable Mountings Optional • Master Flood and Shovel Lights • Electric or Gas Engine Driven Power Blow Hammers

NEWS FROM MANUFACTURERS

About Their Products

The publications reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

BELT CONVEYOR IDLER—**Link-Belt Co.**, 307 N. Michigan Ave., Chicago, Ill. (16 pp., illustrated) Gives detailed information in regard to the new "100" antifriction idler for belt conveyors and lists the various sizes available in the several types which include troughed carrying-run idlers; flat-roll carrying and return idlers; troughed self-aligning idlers; and self-aligning return idlers. Dimensions, weights and list prices are given. Opening pages of book depict Link-Belt conveyor progress through the years, showing drawings of twelve different designs of conveyor idlers dating back to the year 1896. Features of new idler described in booklets (1) Positive grease seal which keeps grease in and dirt out of antifriction bearings; (2) troughing rolls aligned in steel frame assembled in jigs to assure correct bracket spacing and roll interchangeability; (3) roll shafts locked in frame, yet quickly and easily removed; (4) interlocking nuts and yokes to keep roll supporting brackets from spreading; (5) equipped with pipe extensions for safe center-roll lubrication from one end of troughing idler unit; (6) all rolls in each troughing idler of same length and interchangeable.

★ ★ ★

BUCKET GUIDE—**The Hayward Co.**, 50 Church St., New York, N. Y. (16-pp., pocket size, illustrated) This factual publication is designed for the busy operating man who wants a quick picture of the improved types of buckets now available, the uses for which each is recommended, the capacities and sizes obtainable. Information and data on rehandling and digging clamshell buckets, electric motor buckets, standard and multi-power orange-peel buckets, sewer catch-basin buckets, automatic take-up reels and grapples for a wide variety of materials such as tiered wood, manure, rocks, tree trunks and pulp wood.

★ ★ ★

ADHESIVE DATA—**Minnesota Mining and Manufacturing Co.**, Adhesive Division, St. Paul (6), Minn. (8 pp.) This booklet, which will prove helpful to users of adhesives or coating materials, impregnators, spray-on insulators and sound-deadening compounds, lists the various formulae for adhesives made by company, and shows viscosity, bonding range and method of application. Referring to this book will prove helpful in selection of correct material to use.

MORE EFFICIENCY FOR MECHANICAL TAMPING

With the NEW Gardner-Denver Backfill Tamper

Meet the new backfill tamper that brings new efficiency . . . new operator comfort and convenience to mechanical tamping.

The Gardner-Denver T-23 Backfill Tamper is a rugged, exceptionally well-designed construction tool that will compact backfill to meet the most exacting requirements . . . and do it *fast*. It is a product of skilled Gardner-Denver engineers . . . men who have gained their experience in the field and have incorporated that experience in the design of the backfill tamper.

Tamping the backfill of a city street opening.

Integral oil reservoir has ample capacity to assure complete lubrication of all working parts. Feeds only when the tamper is in operation.
Low-lift, end-seating type valve will sustain efficiency of piston action over long period of time.
Cylinder bore is burnished by a special finishing process for greater wear resistance.
Front head of cylinder compresses piston rod packing as it is screwed on the cylinder and when correct compression is reached, a locking pin is dropped into place and retained by a snap ring. Piston rod packing is quickly and easily accessible.
Double taper locking feature of tamping pad holds pad securely in place against all shock and vibration. Easily removed when necessary.

The smooth-holding characteristics and the ease with which the T-23 can be "walked" over the fill will quickly make it a big favorite with operators. And because it reduces operator fatigue and speeds operations, it will be a big favorite with contractors. There's no need to worry about valve or exhaust freezing in cold, damp weather. The T-23 is built to operate efficiently in all kinds of weather.

For complete information on the new Gardner-Denver Backfill Tamper, write Gardner-Denver Company, Quincy, Illinois.

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Since 1859

HAISS PORTABLE CONVEYORS

★ Cargo Conveyors for Industrial Use
★ Troughing Conveyors for Loose Materials
★ "Coal Special" Type
★ "Motomove" Self-Propelled Conveyors

FOR WAR-TIME LABOR SAVING

Flexible... Adaptable... Relatively Inexpensive... Conveyors as Haiss builds them are the logical answer where man-shortages make each workman's labor precious.... Haiss Portable Conveyors are *engineered* jobs, with loads carried on high-grade ball and roller bearings. Frames are truss-designed for strength without excess weight.

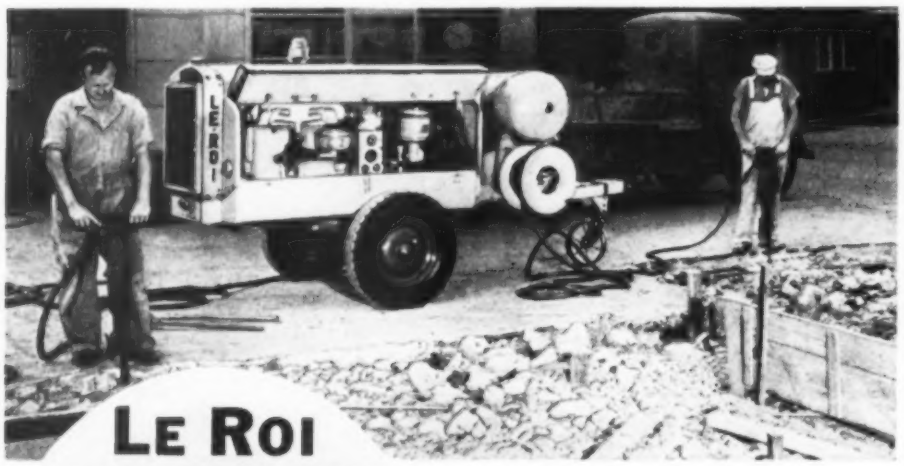
Essential Industry Inquiries and Orders given prompt attention. Write us.

GEORGE HAISS MANUFACTURING CO., INC., 139th & Canal Place, New York, 51, N. Y.

WELDING AND CUTTING SAFETY STANDARDS—**The American Standards Assoc.,** 29 W. 39th St., New York, 18, N. Y. (32-p. booklet) Another in the series of American War Standards entitled "Safety in Electric and Gas Welding and Cutting Operations" designed to serve as a guide for the protection of the operator from injury or illness and for the preservation of property from fire or other damage arising from improper methods in the installation, operation, or maintenance of welding and cutting equipment. It covers every phase of safety applicable to all ordinary welding, cutting, brazing, lead burning and flame treating operations. Copies at 40c each may be ordered from the above company.

★ ★ ★

POLYVINYL RESINS AND PLASTICS—**The B. F. Goodrich Co.,** Akron, Ohio. (4-p. folder) Contains description of a group of polyvinyl resins and plastics which have recently been developed and offered to users under the trade name "GEON." One page is devoted to an outline of the characteristics of the four Geon resins. A properties table for each is included. Geon plastics is the subject of another page, with the range of characteristics described. The plastics are furnished in ready-to-use compositions, either of standard compounds or tailor-made formulations, in either sheet form or granules. Another page is devoted to a partial list of the Geon resins and plastics applications, including electrical service, extruded products, gaskets and packing as protective coatings, for coated fabrics and papers and calendered and cast sheets and films.



LE ROI COMPRESSORS "break it up" *faster*

Le Roi Compressors are quality-built to give you more air — faster. They're famous for their ability to turn out the tough jobs in record time—for their extra mobility in getting to the job—up close to working areas—and away to the next one without loss of time. Le Roi Compressors are the only ones in which both engine and compressor are built by the same manufacturer—to give you the benefit of integral design, smooth-running teamwork, and undivided responsibility for performance. All sizes are available for approved projects.

Consult your nearby dealer. C-44

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★ ★ ★

REPAIR OF VALVE CHIPPERS — **Ingersoll-Rand Co.,** Phillipsburg, N. J. (wall chart, 22x38 in.) Metal bound, two-color chart, entitled "Easy Repair Operations for I-R FLAPPER VALVE CHIPPERS," is illustrated with an "exploded view" of the hammer, a cross-section view, a number of cross-sections of the various parts and drawings of the few simple tools required for proper maintenance, such as reamers, lappers and gages. Also illustrated are the various recommended maintenance operations. Clearances and settings are expressed in steel rule and micrometer values. Lists stock sizes of oversize replacement parts and how to determine which to order, the proper methods for lapping, reaming, and re-bushing, and instructions for proper lubrication and cleaning.

★ ★ ★

CONSERVATION WELDING—**American Manganese Steel Division, American Brake Shoe Co.,** Chicago Heights, Ill. (4-p. folder, illustrated) How welding can be made to cut replacement costs is set forth in this bulletin which contains a wide range of helpful suggestions in regard to such operations as the repair of tractor sprockets, manganese steel crusher mantles, clamshell bucket teeth, manganese steel rock hammers, crusher liner segments, conveyor screws, pusher shoes and other parts. Its main theme is that while in normal times it is occasionally cheaper to scrap a worn part, in these days of stringent metal shortages, the welding rod is a valuable friend in need.

AN UNBEATABLE COMBINATION

This war has proved in a thousand ways the importance of teamwork; teamwork between army, navy and industry, between navy and air force, between artillery and infantry, between a soldier and his gun. Good men with poor equipment haven't been able to stand up to inferior men with better equipment. Good men *and* good equipment are unbeatable . . . on the fighting fronts, on the air bases, in the shipyards, in the quarries, in the metal mines, in the coal mines.

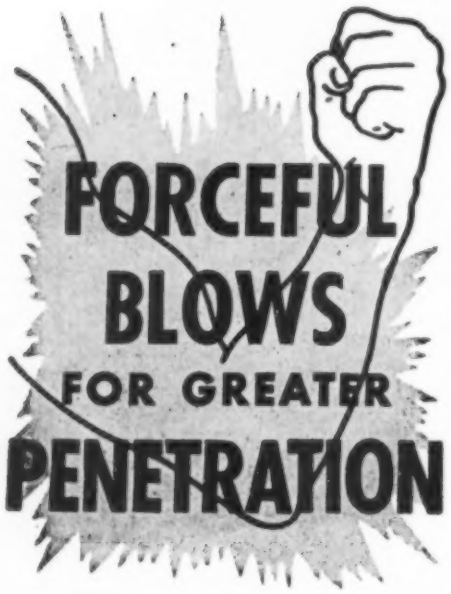
Experience and reputation in designing and building outstanding excavating equipment led to the selection of Bucyrus-Erie to work with the Army on the design and manufacture of the new 240-mm. howitzer, now in action. We're proud of that selection and of the phenomenal accuracy this weapon is demonstrating in battle. The same factors that make this largest U. S. mobile gun a leader, make your Bucyrus-Erie excavators "years ahead." In this war, all over the world, Bucyrus-Erie excavators, in the hands of good men, are shattering old production records. Post-war Bucyrus-Eries in the hands of your men will be an unbeatable combination.

V-61 C

ARMY E NAVY

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.



SUPER-VULCAN OPEN TYPE DIFFERENTIAL-ACTING PILE HAMMERS

18C, 30C, 50C and 80C

• Here is the modern pile driving means with which to meet time specifications on the most extensive projects. In telling of successful results with his Super-VULCAN, a contractor said his 50c size drove piles six feet per minute. Hard hitting blows at a rate of twice the usual blows per minute do each job faster and at less cost. You add steam savings to all the other VULCAN economies because you save 25 to 35 per cent of the usual steam requirements.

Super - VULCAN Hammers are being currently used in the Solomons and other theaters of war.

The open type fits the same leads and uses the same accessories as the well known widely used VULCAN Single-Acting Pile Hammers.

Sizes
18C—30C—50C—80C
meet all needs

VULCAN IRON WORKS
Since 1852
331 North Bell Avenue
Chicago 12 ---Illinois

SLIP-PROOF PLASTIC FLOOR COVERING—**Truscon Laboratories,** Caniff & G. T. R. R., Detroit, 11, Mich. (4-pp.-illustrated folder) Describes and illustrates uses and advantages of "Saf-T-Dek," a slip-proof floor covering developed originally to help make footing safer on shipboard and now available for civilian uses. This covering when applied to walking areas, not only assures safe footing but also takes a great deal of surface wear itself, thereby reducing maintenance problem. It comes ready for use and is applied with a trowel to a thickness of about 1/32 in. It is a tough, tenacious material, sticks to practically any surface, wood, steel, concrete and even glass. Even when the Saf-T-Dek area is wet or covered with oil emulsion, it is said still to be non-slip. Available in two standard colors, tile red and concrete grey. May also be had in a spark-proof type where non-sparking floors are considered necessary.

★ ★ ★

FINISHING MACHINE—**Madsen Iron Works,** Huntington Park, Calif. (8 pp., illustrated) Set forth in this bulletin are mechanical features and advantages of Johnson float finisher which mechanically finishes concrete highway surfaces heretofore done by hand floats. Receives material directly from tamping or spreading machine and is said to leave smooth, finished roadway with surface variation of less than .05 of an inch in 10 ft. Advantages listed: (1) keeps up with largest high-capacity mixers; (2) steps up daily production of paving crew; (3) makes smoother, more perfect road surface; (4) maintains daily production speed; (5) eliminates four to six hand finishers; (6) saves in labor cost; (7) efficient on all modern vertical, horizontal and transverse spiral curves. One page devoted to hand tools for cement finishing.

Serving the Services is a HIGH HONOR

WHITE TRANSITS and LEVELS

are doing an outstanding job throughout the World

TYPE II U. S. ARMY TRANSIT

• ACCURACY • PRECISION
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Recommended for precise Municipal, Railroad, Highway and Bridge Work.

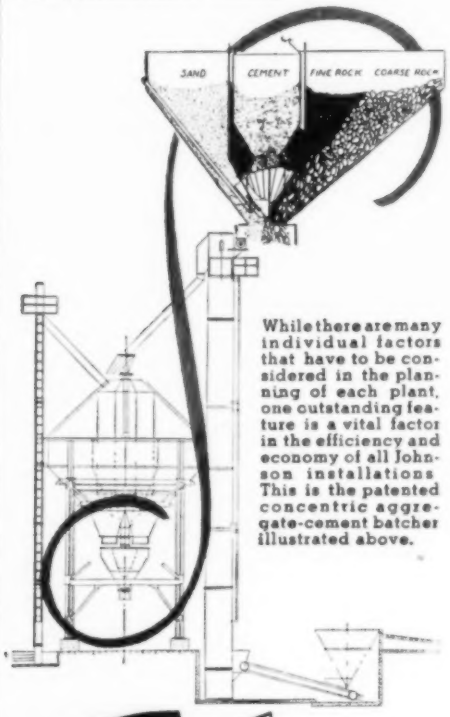
DAVID WHITE CO.
315 W. Court St. Milwaukee 12, Wis.
• Send for Bulletin 1039

From **BOULDER DAM** *to* **TVA's FONTANA**

One or More Johnson Mixing Plants Proportioned Material on Practically Every Major Project

• The selection of Johnson Mix Plants to handle more than sixty million yards of concrete on more than 31 major projects is practical evidence of The C. S. Johnson Company's qualifications to handle the planning and construction of any Mixing or Batching Plant . . . regardless of size or location.

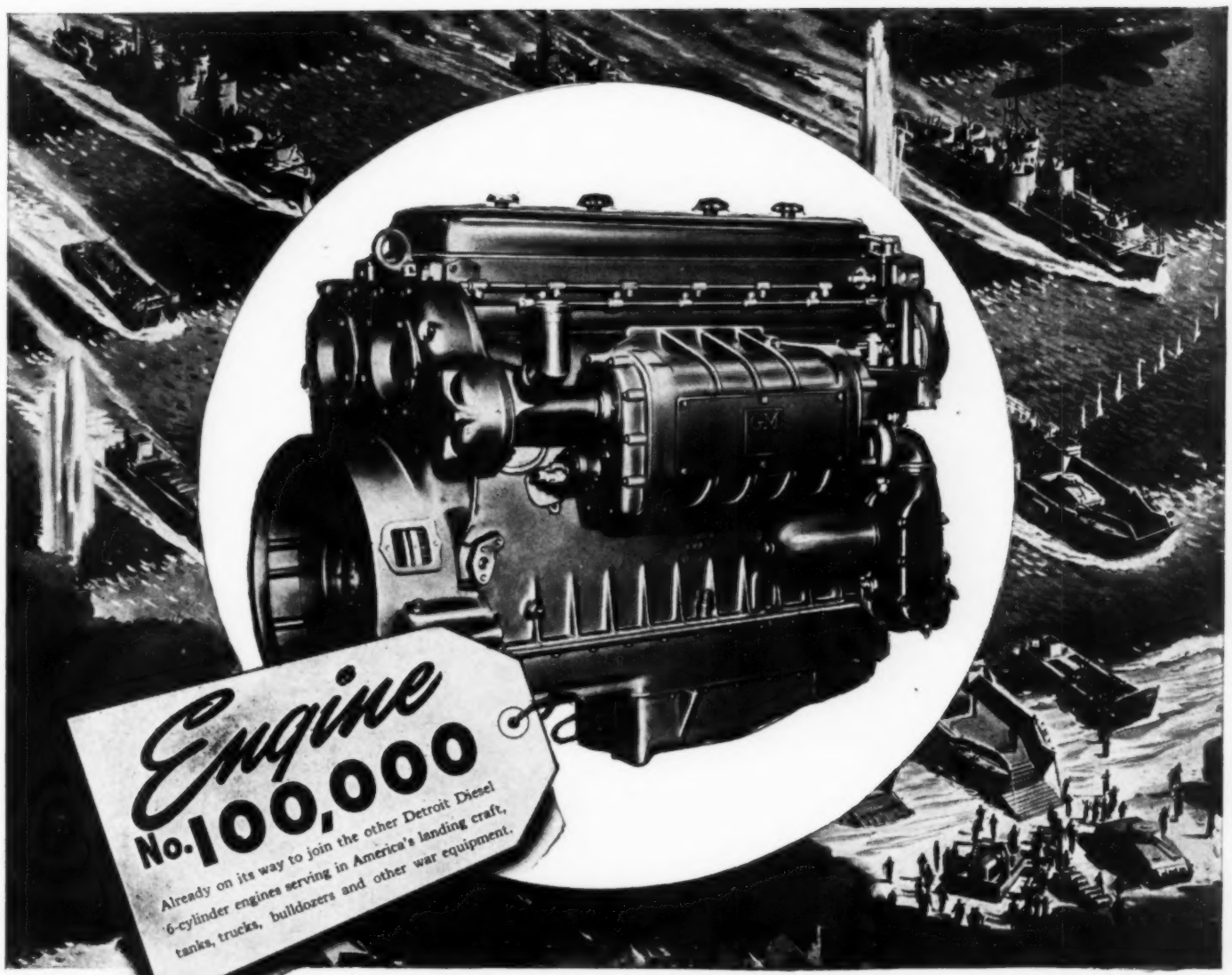
Among the many important advantages to the user of this distinctive Johnson Batcher are (1) Intermingling of aggregates with cement when discharged, which assures a 20% pre-mix and pre-shrinkage. This provides a full capacity mixer charge; (2) Elimination of gumming and excessive wear by prevention of any large amount of cement touching wet mixer walls; (3) Reduction of cement dusting; (4) Elimination of the use of screws, chutes or other mechanical means of bringing the cement to the mixer. Write for outstanding features and performance records.



While there are many individual factors that have to be considered in the planning of each plant, one outstanding feature is a vital factor in the efficiency and economy of all Johnson installations. This is the patented concentric aggregate-cement batcher illustrated above.

Write for Data on Johnson's
EVEVATORS
BATCHERS
PORTABLE BATCHING PLANTS
BINS

the C. S. JOHNSON COMPANY
Champaign, Illinois


Engine
No. 100,000
Already on its way to join the other Detroit Diesel 6-cylinder engines serving in America's landing craft, tanks, trucks, bulldozers and other war equipment.

10 DIVISIONS OF FIGHTING ENGINES

MONTHS ago the Detroit Diesel Engine Division of General Motors sent engine No. 100,000 off the production line to its war job. Many more have followed since. Measured as men, more than ten divisions of these six-cylinder Diesels are actively in the fight. They're in landing craft helping to crack Fortress Europe and to cut the Nips' string of islands. They're in tanks, trucks, bulldozers and all kinds of other equipment. The reasons are, these Diesels are tough and dependable. They're easy to maintain. They burn inexpensive fuel oil.

They have been tried and proved in all sorts of war jobs on every battle front. And they've been found good.

With the coming of peace these engines will be available for all the applications where America will need reliable, low-cost power.

KEEP AMERICA STRONG BUY MORE WAR BONDS

GM
GENERAL MOTORS
DIESEL POWER

ENGINES . . 15 to 250 H. P. . . **DETROIT DIESEL ENGINE DIVISION,** Detroit 23, Mich.

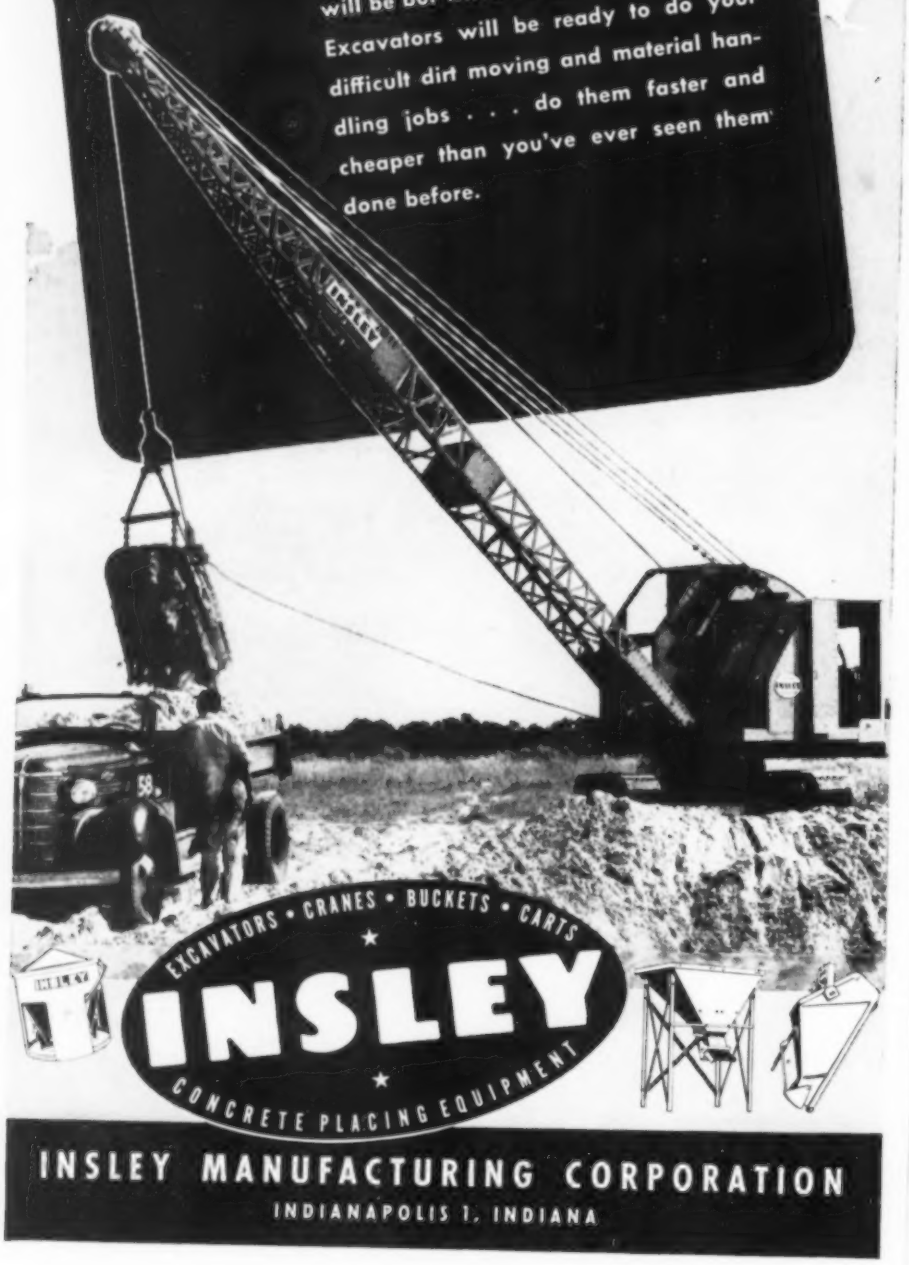
ENGINES . . 150 to 2000 H. P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

LOCOMOTIVES . . . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.

for your job . . .
a better INSLEY
IS ON THE WAY

When construction actually begins on the postwar plans that are on today's drawing boards, Insley Excavators will do their full share to help make these plans a reality.

No one can predict when this day will be but when the time comes, Insley Excavators will be ready to do your difficult dirt moving and material handling jobs . . . do them faster and cheaper than you've ever seen them done before.



INSLEY MANUFACTURING CORPORATION
INDIANAPOLIS 1, INDIANA

WOOD-WALLED ROOMS—**The Mengel Co., Louisville, Ky.** (16 pp., illustrated) "Beautiful Wood for Beautiful Homes" is the title of this brochure prepared for free distribution. Illustrated with full-color reproductions of wood-walled rooms, the publication is the latest undertaking in a joint campaign by the two largest plywood concerns to build public appreciation and use of Weldwood plywood and Mengel doors for homes in every price range. Advantages, description and illustrations of various kinds of plywood, together with room designs by prominent architects, are featured. Readers are assured that Weldwood plywood is guaranteed for the life of any home in which it is used and that it is economical to install and practically free from maintenance expense.

★ ★ ★

STEEL REPAIR PARTS—**Hercules Steel Products Co.**, Buffalo 2, N. Y. (Three folders) Three new products, the use of which will assure the speedy return of an incapacitated machine to the job are described in these folders: (1) Improved "Shu-Kleets" for retreading grousers on all makes of tractors may be applied without dismantling machine. They are welded to projecting point of track shoe by gas or electric operation, using either all-purpose steel electrode or manganese rod; (2) tractor link-repair plates made of work hardened steel for building up worn rail. Attached to casting by welding along edges and in two openings at top; (3) "Nu-Tip" repointer bars for teeth for excavating equipment such as shovel dippers, buckets, draglines, trenching machines, road rippers and scarifier teeth. Attached by welding.

National
Carbide
FLOODLIGHTS
VALUABLE IN PEACETIME

A NECESSITY NOW!

FOR ALL PURPOSES WHERE FLOODLIGHTS ARE REQUIRED.

Simple in Construction
Economical in Cost
Dependable in Operation

Available in 1500, 8,000 and 16,000 candlepower units.

Write today for literature showing entire lines of Floodlights and Lanterns.

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60 East 42nd Street
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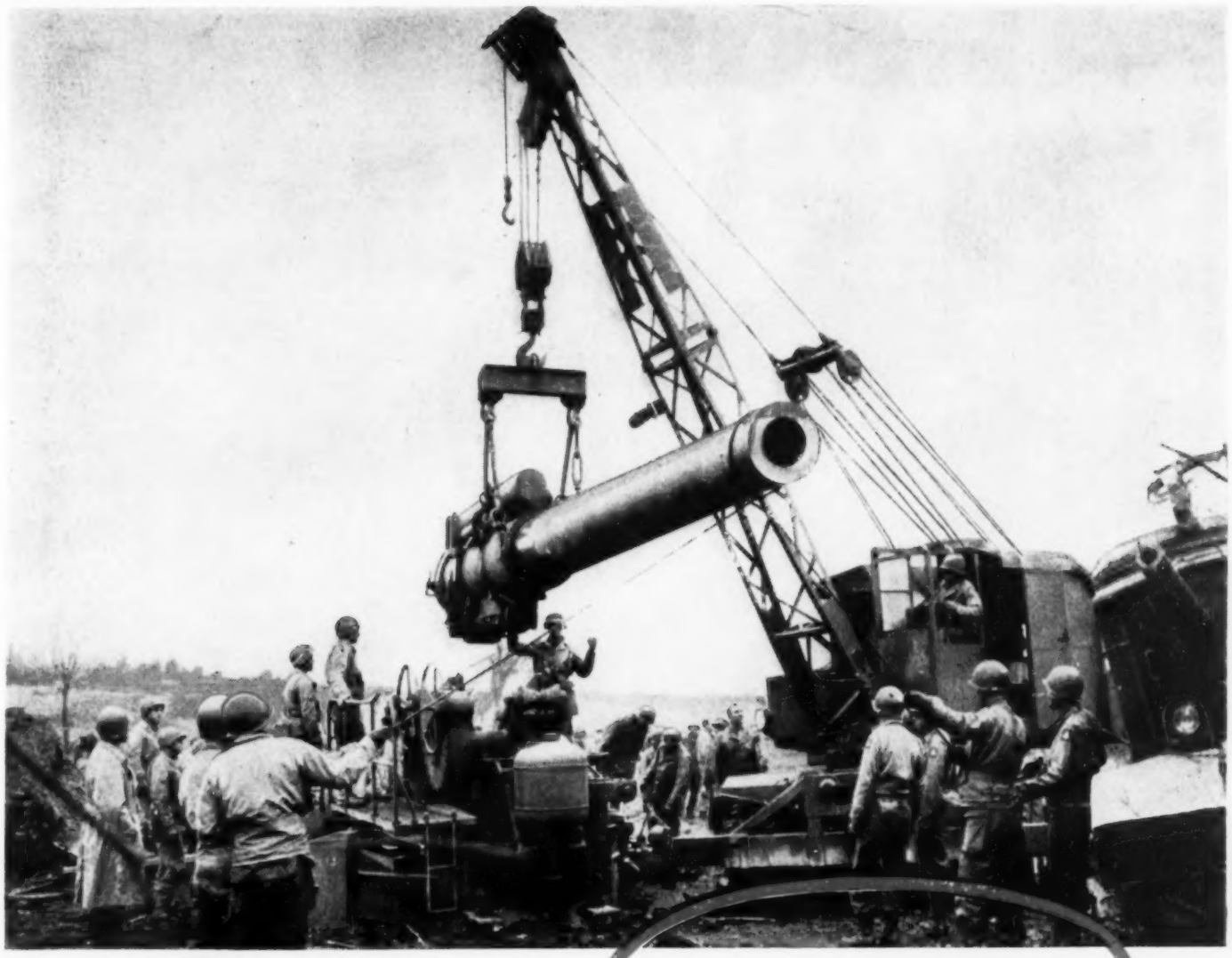


Roping A HOWITZER

SPEEDY field-assembly of heavy 240-mm. howitzers . . . the biggest mobile artillery short of railway guns . . . demands a high degree of team-work and "know-how." Well-conditioned wire rope also plays an important part in the ease with which these mammoth weapons are swung into position.

That is just one of countless jobs, in the Army and throughout industry, where wire rope helps step up performance efficiency. Contractors everywhere know that a sure way to keep their wire rope flexible and protected against wear and core-rot is lubrication with *Texaco Crater.*

Texaco Crater penetrates to the very core of wire rope, sealing each wire in a tough, viscous film that reduces internal friction, keeps out moisture, prevents corrosion, *keeps rope stronger longer.*

Used on open gears, *Texaco Crater* cushions load shocks, stops undue wear, quiets the noise. It doesn't ball up, channel or throw off, but clings to tooth surfaces, following through from gear to gear, despite heavy pressures, high temperatures and peripheral speeds.

Texaco lubricants have proved so effective in service that they are definitely preferred in many fields.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

FREE! 36-page booklet explains new low-cost protection against rust. Tells how to make equipment last years longer. Write for your copy.

TEXACO
CRATER

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

PARSONS
TRENCHLINER

Conveyor belt has V strip for engaging groove in end rollers to prevent side slipping.

WIDE NON SIDE-SLIPPING CONVEYOR BELT

V strip molded to underside of wide 22 inch conveyor belt engages with a groove in the center of the end drums. Side slipping of belt is prevented by this design, increasing the life of the belt. Idler rollers are mounted on anti-friction bearings. Conveyor frame is hinged for folding along the side of the Trenchliner to reduce traveling width. Control is through one lever. Action is immediate for fast changing from side to side.

THE PARSONS COMPANY

• • • • NEWTON, IOWA • • • •

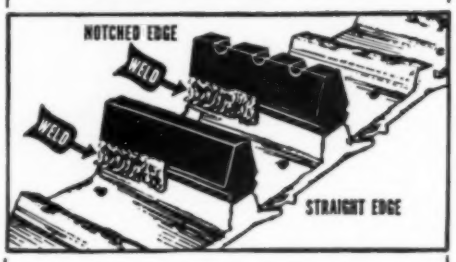
TRENCHING EQUIPMENT PARSONS

SHOCK-ABSORBING HAMMERS AND MALLETS—**Greene, Tweed & Co.,** Bronx Blvd. at 238th St., New York, 66, N. Y. (4 pp., illustrated) Bulletin entitled "A Blow Without a Dent," describes and illustrates the BASA replaceable face hammers and the Empire soft face mallets manufactured by this company. Special feature is display of plastic faces and heads now available for these tools. Bulletin outlines particular advantages of special material chosen for this purpose and explains why this plastic is superior to many other materials in the various tool uses. Rawhide, copper or babbitt faces can also be furnished for the BASA hammers and plain or loaded rawhide heads for the Empire mallets. Bulletin also describes distinctive features of these tools: split adjustable heads of hammers which permit the interchangeable faces to be replaced within a few seconds and the carefully distributed weight of both hammers and mallets which permits blows to be struck without transmitting shock which would cause fatigue of the user.

★ ★ ★

REINFORCED CONCRETE—**Portland Cement Association,** 33 West Grand Ave., Chicago 10, Ill. (24 pp., illustrated) No. 10 in series on "Modern Developments in Reinforced Concrete" presents methods of interest to designers for frame analysis of flat slab bridges and for determining pressure on culverts under wheel loads on concrete pavement slabs. Brief article describes continuous concrete girder bridge in Georgia.

Rebuild your
TRACTOR GROUSERS
WITH **BULLDOG**
Grip-Lugs



Easily Welded

OTHER PRODUCTS
TRAK-LINK RE-NU PLATES
MANGO BARS FOR REPOINTING DIGGER TEETH
EXCELLOY OVERLAY METAL

SEND FOR FOLDER CM

ALLIED STEEL PRODUCTS, INC.
NBC Bldg. Cleveland, Ohio

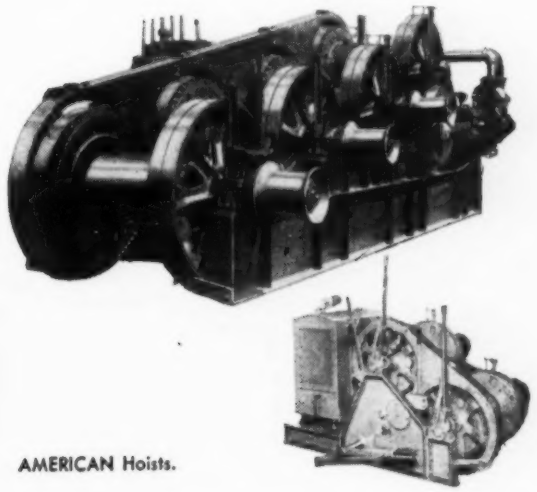
American
MATERIALS HANDLING FOR EVERY CONSTRUCTION JOB

AMERICAN REVOLVER on high level trestle at Fontana Dam. This REVOLVER has been in dam construction work for over five years.

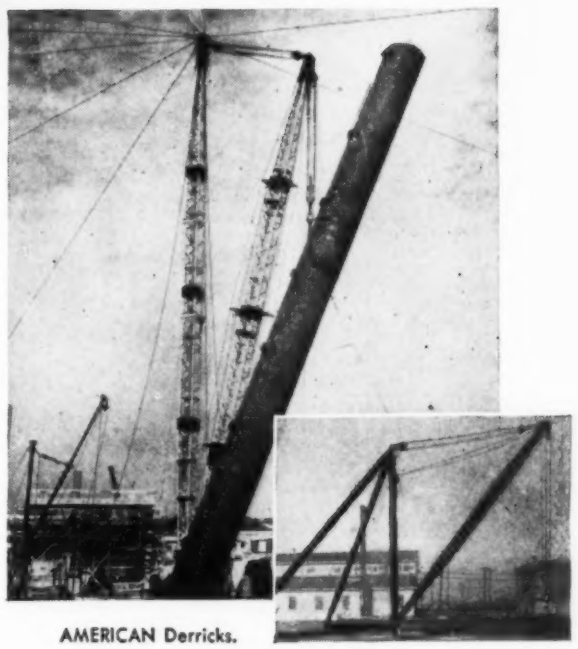
This gantry-mounted, revolving crane offers the ultimate in reach, lifting capacity, and maneuverability in materials handling for dams and other large construction projects. Over the years they have proved a natural for placing reinforcing steel forms, and pouring concrete, stripping forms, etc.

Now is the time to look into your materials handling methods. Catalog 400-R-1B illustrates and describes the construction features of these revolving cranes and shows how others are using them.

OTHER *American* MATERIALS HANDLING METHODS



AMERICAN Hoists.



AMERICAN Derricks.

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Plan now . . . but wait for **AMERICAN!**

AMERICAN

MATERIALS HANDLING *for* **EVERY INDUSTRY**

AMERICAN HOIST & DERRICK CO.

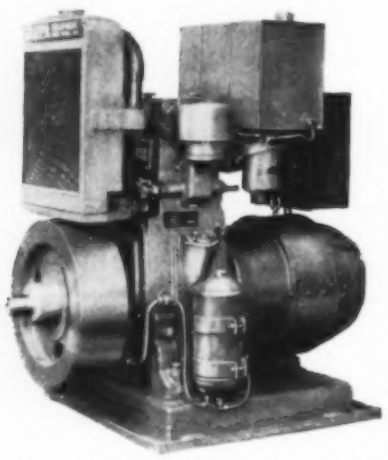
Saint Paul 1, Minnesota

CHICAGO SAN FRANCISCO NEW YORK

Wherever wire rope is fastened . . . . use genuine **CROSBY CLIPS** *with the Red-U-Bolt*

Another Dependable GRIFFIN DIESEL GENERATOR

Model F-100



Complete self-contained Diesel plant. 4½ KW and 9 KW. D.C. or A.C. Built for continuous service at low operating and maintenance costs.

Engineered and built to give you the same dependable long life as all Griffin products

Call or write any of the addresses below.

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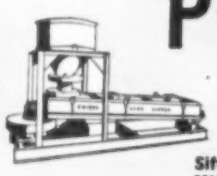
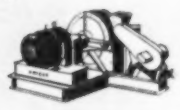
MAIN OFFICE: 881 EAST 141st STREET, NEW YORK 54, N. Y.

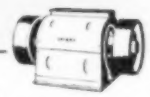
GRIFFIN EQUIPMENT
and Supply Corporation

Materials
PROCESSING EQUIPMENT



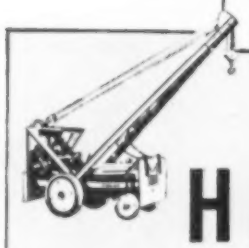


Sifters, Crushers, Cutters, Dry and Liquid Mixers, Mills, Grinders, Pulverizers, Conveyor Systems, Complete Installations.

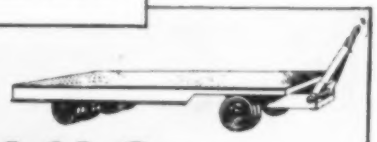


The handling equipment construction "know-how" of the Mercer Engineering Works, Inc., Clifton, N. J. . . . The more than 40 years processing equipment experience of Robinson Mfg. Co., Muncy, Pa. . . . All are embodied in and represented by

MERCER-ROBINSON, CO., INC.
30 CHURCH ST., NEW YORK 7, N. Y.



Materials
HANDLING EQUIPMENT



Trailer Trucks (All Types) Wheel Tractor Cranes (3 to 7 ton) Fork Lift Trucks, Lift Platforms, Hoists, Live Skids, Wheels, Casters.

Concrete Wind Tunnel

(Continued from page 79)

nel's air flow is created by a 24-ft.-dia. propeller-like fan located at the nacelle. A Westinghouse motor of 18,000 hp. driving a 14-in. solid steel shaft at 514 r.p.m. is the power unit for the fan, which consists of 16 laminated spruce blades built and designed by Boeing engineers.

Allowance for Concrete Expansion

The tunnel is divided into a number of sections to take care of expansion of the concrete due to a 70-deg. variation in temperature. Certain of the joints are designed to take a pressure of 150 lb. per sq. ft. inward and 250 lb. per sq. ft. outward. At one time rubber filler or wedging pieces were considered, but as it was not possible to get a positive connection between the concrete and the rubber, this idea was abandoned.

The forward part of the nacelle is constructed of 12-gage metal skin fastened to bent angle rings. Access doors are provided so an observer can watch the operation of the fan. The rear portion of the nacelle is of wood built up on laminated plywood ribs and it is supported fore and aft of the fan by steel struts which are encased in farings of 12-gage sheet metal.

To move in equipment and for general access, a number of doors were provided into the tunnel. They had to be flush on the inside with no hardware protruding from the face. Some of the doors had to be designed for inward pressure, others for outward, and others for both inward and outward. In general, they were built of wood framed with steel and sealed with rubber gaskets and special locking devices to prevent chatter.

Model planes with wing spreads up to 11 ft. or full-scale airplane sections of the same maximum size can be tested in the tunnel. All tunnel controls are centralized in the panel board before the test section, at the same place where model observations are made. The tunnel is sound-proofed throughout and even its highest speed operation is scarcely audible in adjoining quarters.

Building Isolated from Wind Tunnel

The building in connection with the wind tunnel, which is to be used for model shop, operations room, offices and

(Continued on page 150)

THE G.I. SHOVEL WITH THE HIGH I.Q.

This Buckeye equipment will save on your post-war jobs!

Buckeye "Centro-lif" Bulldozers and Trailbuilders, Cable Control Units and other Tractor Equipment, Spreaders, Trenchers, Road Wideners, R-B Power Finegraders.

American construction equipment has become a potent weapon; is giving a good account of itself on every front. As always, some pieces of equipment are giving outstanding performance, and the Buckeye Clipper is one of them. The U. S. Army does not endorse any product—plays no favorites—which is fair all around. But men in the service, from our town and elsewhere, former shovel operators and even some of our employees in the service overseas, tell us what a swell job Clippers are doing. We quote:

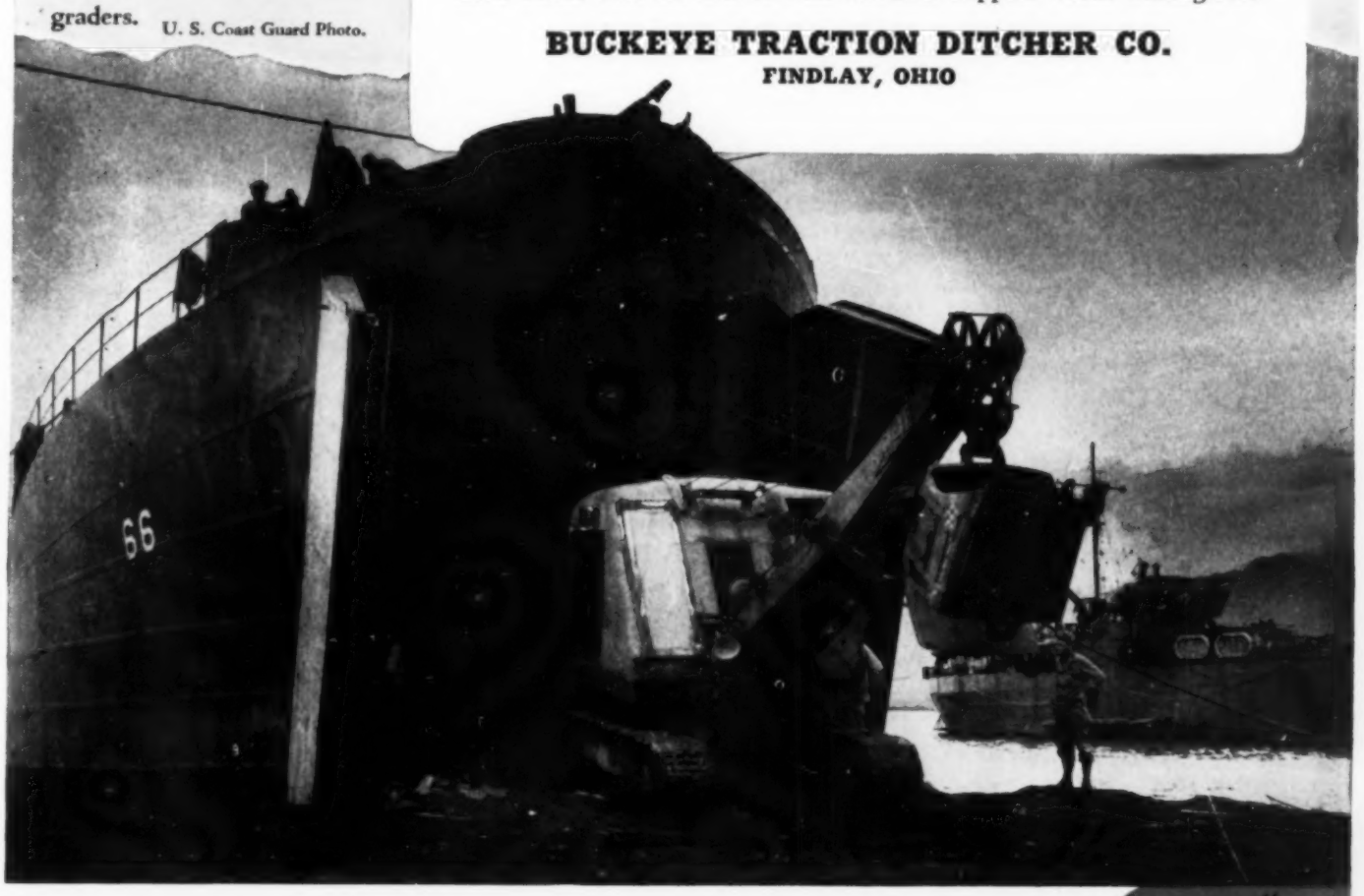
> "You don't need a high I.Q. to run this G.I. shovel—it practically runs itself. Vacuum power control sure makes it easy to handle. It's easy to maintain, too. The guy who designed it sure felt for the 'Joes' on the maintenance end."

Well said, soldier! The trickle of Clipper repair parts going to operational bases bears out that last statement. Clippers are getting more abuse at the "fronts" than they ever got on construction jobs, in clay and gravel pits or in material yards, but they can take it.

We've had to put off a lot of people who wanted Clippers—war comes first. Those who are able to wait will find Clippers worth waiting for.

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO

U. S. Coast Guard Photo.

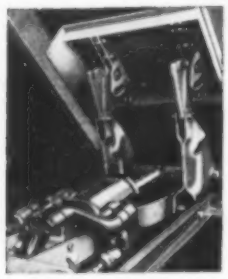


Buckeye Clippers
CONVERTIBLE SHOVEL—CRANE—TRENCH HOE
with exclusive MEVAC METERED VACUUM POWER CONTROL

HERCULES

HYDRAULIC HOISTS and DUMP BODIES

GIVE DEPENDABLE SERVICE ON ALL KINDS OF JOBS



HERCULES HYDRAULIC BOOSTER HOIST

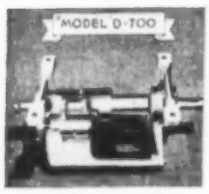
Makes any truck a Dump Truck

Install HERCULES DOUBLE-ARM HYDRAULIC HOISTS under your platform, stake, express or special bodies, which are now idle. Unload the easy way!

This is the Model KXE Hoist, with 6" cylinder, for bodies up to 12 feet long. Body reinforcing plate and steel sills included. Control valve is operated from driver's seat.

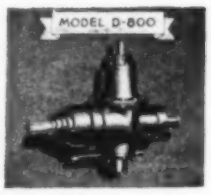
USE THE HERCULES SPLIT-SHAFT POWER TAKE-OFF

To operate any truck-mounted equipment



Direct (D-700 Series), Side (D-800 Series) and Dual Drive (B) models are available for operation of almost every possible type of truck-mounted equipment, either singly or in combination.

Recommendations and complete specifications upon request.



HERCULES STEEL PRODUCTS CO.

GALION, OHIO

WELLMAN
WILLIAMS TYPE
BUCKETS
Williams Buckets have been famous for their many fine mechanical details for nearly 40 years. Since 1931, Williams Buckets have been built by Wellman.
WELDED CONSTRUCTION, featured in Wellman custom-built buckets, which made them so predominant in heavy duty steel mill service, is now applied to all
Wellman-Williams Buckets
FOR LONGER SERVICE WITH LESS MAINTENANCE COST
built in Multiple Rope, Power Arm, and Power Wheel Types in ⅜ yd. to 16½ yd. capacities.
SEND FOR FREE BULLETIN—Tell us about your particular requirement and we will send full description of construction and features in special bulletins which clearly prove why YOUR NEXT BUCKET SHOULD BE A WELLMAN.
THE WELLMAN ENGINEERING CO.
7017 Central Avenue
Cleveland 4, Ohio
Sales and Service Agencies in principal cities.
ARMY
NAVY

(Continued from page 148)

drafting rooms, was isolated from the tunnel itself by an expansion joint that extends through floors, walls and roof. The entire building and tunnel were built on piling driven to 40,000-lb. bearing capacity with piles approximately 35 ft. long. The foundation of the test section was again isolated from the supports of the tunnel itself and a group of 16 piles were driven to support the balancing equipment under the test section and to permit the reading of the delicate instruments that might be subject to vibration by the operation of the tunnel.

★ ★ ★

Drafting Room Lighting

(Continued from page 92)

may be higher with the board in a vertical position, in spite of the poorer utilization of light on the board when in this position. When consideration is given to other factors which influence seeing ease besides visibility, *i.e.*, reflected glare and shadows, the superiority of the vertical position becomes quite evident (*Figs. 11 and 12*). Furthermore, the vertical position has other advantages, such as greater visual comfort by a more uniform surrounding brightness (board occupies most of the visual field); greater utilization of floor space (30 to 50 percent more boards in a given area); and possible reduction in the physical strain on draftsmen through easier posture (*Fig. 13*). Actually the first step toward the solution of the lighting and seeing problems in the drafting room is to adopt the vertical position.

Illumination for Tracing

One of the most difficult jobs which the draftsman is called upon to perform is that of tracing, particularly when the visibility of the original is low. The usual method of illuminating such work is by means of the regular overhead lighting, which might be referred to as surface illumination. The other method of lighting for tracing is to provide an illuminated surface (*Fig. 14*) which projects light through the original, silhouetting the lines on the drawing. This method of

(Continued on page 152)

BREAKING
DRILLING
DRIVING
TAMPING
CRIB BUSTING

BARCO

PORTABLE
GASOLINE HAMMER

With a Barco Portable Gasoline Hammer in his hands, any workman, regardless of his stature, becomes a giant of strength. A Barco enables one man to do the work of several . . . under rugged conditions . . . in hard-to-reach spots . . . and at low operating cost. Eleven special tool attachments make this self-contained unit adaptable to a wide range of jobs. Write for additional information to: The Barco Manufacturing Company, Not Inc., 1812 Winnemac Ave., Chicago 40, Illinois.

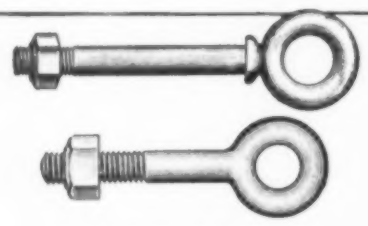
•

In Canada: The Holden Co., Ltd., Montreal

THE FREE ENTERPRISE SYSTEM IS THE SALVATION OF AMERICAN BUSINESS

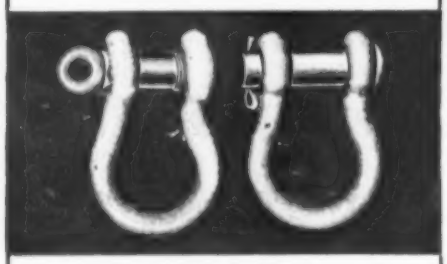
HERE'S A LINK FREE FROM PLAY OR SHEARING ACTION ON THE RIVET

Laughlin's drop-forged, heat-treated "Missing Link" is matched under pressure . . . so there is no play between the halves, no shearing action on the rivet. Under stress, the rivet merely holds the missing link together. The interlocking lugs take the load.



WIDE RANGE OF EYE BOLTS

Laughlin's drop-forged, weldless eye bolts are available in any length or diameter, with or without thread or shoulder. Galvanized or Plain. Stock sizes: ¼" x 2" to 1¼" x 20".



SHACKLES MADE TO U. S. GOVERNMENT TOLERANCES

Drop-forged steel, weldless anchor shackles, made in all sizes from 3/16" to 2½". Can be furnished with either screw pin, round pin or bolt and nut. Galvanized or Plain-finish.

Write for latest Catalog on Laughlin Industrial Hardware

Distributed through
Mill, Mine, and Oil Field Supply Houses
See Powers' Road & Street Catalog

FORGING A SHARE IN VICTORY

THE THOMAS LAUGHLIN Company
PORTLAND 6, MAINE

(Continued from page 150)

lighting the work is known as trans-illumination. It makes the job of tracing a great deal easier.

For many years the use of trans-illuminated tracing tables was made difficult by the necessity of using thumbtacks to hold the original and copying surfaces to the drawing table and by the problem of heat. The availability of easily removable adhesive tape now makes it possible to work on even the smallest drawing at any convenient location on the transmitting glass surface. The Mazda F (fluorescent) lamp makes it possible to supply abundant light with relatively little heating.

It is quite feasible today to have large trans-illuminated tracing surfaces tilted to the vertical position, since use of the F lamp permits of more compact construction. One drawback of the glazed, trans-illuminated tracing table has been the fact that the weight of the draftsman leaning on the glass might break it. The vertical position would remove this hazard. Another step toward the solution of the lighting and seeing problems in the drafting room is the general adoption of trans-illuminated tracing tables in the vertical position.

Fig. 14 . . . TRANS-ILLUMINATED TRACING TABLE has surface which projects light through original, silhouetting lines on drawing. Diffusing glass is here raised to show interior construction.

Maintenance of Lighting System

Seeking the most benefits for the money spent is a common drafting-room objective. The adequate maintenance of a lighting system is simply a problem in engineering economics. Unfortunately, in the past, lighting maintenance has frequently been considered primarily as an expense item to be kept as low as possible and, for that reason, it is frequently neglected.

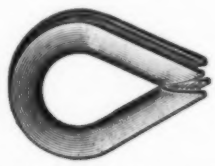
The necessity for good lighting that

(Continued on page 154)

A prominent aviation manufacturer used a Laughlin Safety Hook, as shown, as part of a riveting machine set-up purposely devised for the safety and efficiency of women war workers.

This hook's unique, stout-springed safety latch holds its burden securely despite strain or jolts. That's why workers like it — it's safer.

This latch is available on all sizes and styles of Laughlin hoist hooks.



LAUGHLIN THIMBLES: Two styles . . . regular and plow steel pattern (extra heavy for use with plow steel and high tensile wire ropes).

LAUGHLIN SWIVELS: Made in the following types: jaw and jaw, chain swivel, swivel with jaw end, swivel with swivel. Drop-forged.

Write for catalog showing the complete line of Laughlin Wire Rope Fittings

Distributed through
Mill, Mine and Oil Field Supply Houses

Look for Laughlin Products in
Power's Road & Street Catalog

FORGING A SHARE IN VICTORY

THE THOMAS LAUGHLIN Company
PORTLAND 6, MAINE

STILL GIVING YOU

Long LIFE AND *Sure* LIFT!

To the Man Who Needs a Jack:

There are several *new* reasons why it pays to select a Blackhawk Jack today . . . or to wait for a Blackhawk's arrival, even though a less popular brand should happen to be available.

Here are the reasons:

With war limitations on certain critical materials . . .

Blackhawk continues its great care in selecting the highest quality material available. And then, to make doubly sure that quality will be maintained . . . Blackhawk enforces even more rigid inspection of jacks than in peacetime.

Since a jack is valueless unless it continues to perform in every emergency . . . Blackhawk deliberately assumes increased manufacturing costs to assure a top quality product for you.

So—today, as in peacetime—when you need a jack—buy the best—buy Blackhawk—from your Industrial Supply Distributor.

A Product of **BLACKHAWK MFG. CO., Dept. J2394, Milwaukee 1, Wisconsin**

DEPENDABILITY SEAL OF Tested QUALITY PERFORMANCE

This seal is found ONLY on BLACKHAWK HYDRAULIC JACKS—your assurance of a wise and safe investment.

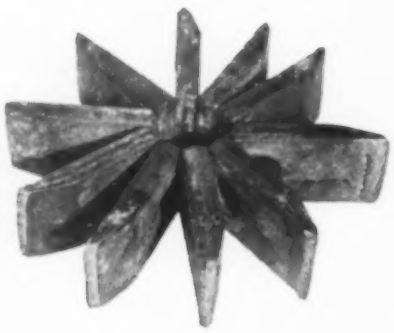
ARMY E NAVY

BLACKHAWK

Each Dipper Tooth made

GOOD AS NEW

in only 30 Seconds!



Shovel digger teeth wear rapidly. Particularly in rocky soil and gravel where they are subjected to excessive abrasion, shock and impact.

To make the teeth of buckets more wear-resistant, to keep them sharp longer and avoid frequent replacements, many companies are relying exclusively on Coast Metals Hard-Facing. Applied to the teeth, as well as lips, runners and other parts, it successfully protects these vulnerable points so that the bucket functions more effectively, more quickly, and at a significant saving in power. After the teeth become slightly worn, they are then given another Coast Metals Hard-Facing and once again made good as new . . . in only 30 seconds!

Coast Metals Hard-Facing meets today's needs for making all machinery, equipment exposed to severe wear last longer. Easily applied by the electric arc or gas torch to any ferrous metal including manganese steel, alloy steel, cast iron and chilled iron. New revised edition of Form X-201 goes into full detail. Write for your copy today.

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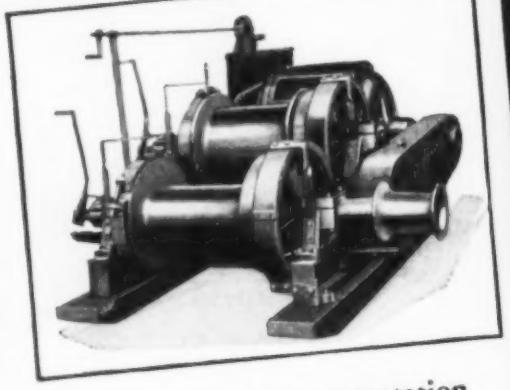
COAST METALS *hard-facing weld rods*

MAKE YOUR EQUIPMENT LAST LONGER

Hoists to Fit the Job



Lidgerwood hoists have earned a 70-year reputation for dependability and efficiency *on the job.* There's a Lidgerwood gasoline, steam, electric or Diesel hoist to fit every construction need. When you need a hoist inquire *first* of LIDGERWOOD.

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HOISTS FOR:
CABLEWAYS
INDUSTRIAL PLANTS
CONTRACTORS
MINES—DOCKS
RAILWAYS

LIDGERWOOD
ESTABLISHED 1873
Manufacturing Company
MAIN OFFICE AND WORKS • ELIZABETH, NEW JERSEY

(Continued from page 152)

prompted the original installation also dictates proper maintenance of the lighting after its installation. Since it is necessary and desirable to obtain the optimum quantity of light that was built into the system originally, consistent with economical maintenance cost, one must give careful consideration to this factor in the selection of the lighting equipment. Thought should also be given before the installation is made to the method in which the system will be maintained. One maintenance technique is illustrated in *Fig. 15.* A regular cleaning schedule and group replacement of lamps, where this is feasible, will usually provide the most economical lighting.

Fig. 15 . . . PORTABLE MAINTENANCE PLATFORM is designed to straddle machinery or desk between two aisles. It is of special value where large numbers of continuous row fixtures are mounted at same height.

Conclusions

In conclusion, it might be pointed out that there does not appear to be available today any type of lighting system which is not subject to some limitations. The following generalizations, however, may be made. Where Mazda C lamps are used for illuminations below 30 foot-candles, indirect lighting is eminently satisfactory. When using between 30 and 50 foot-candles with C lamps in indirect equipment, the brightnesses of large ceiling areas may become objectionable. In general, with large-area flat ceilings indirect filament lighting is uncomfortable above 50 foot-candles. Of course, in small rooms indirect filament lighting of 50 foot-

(Continued on page 156)

THESE SLINGS PASS WARTIME INSPECTION

FOR SAFETY...SPEED...ECONOMY OF MANPOWER AND MATERIALS

When virtually every load is tagged for war production, efficient handling becomes an obligation—one you'll discharge on all counts with Yellow Strand Braided Wire Rope Slings.* *Safety?* The strength of this patented sling lies in tough Yellow Strand Wire Rope, so braided that it gains marked flexibility . . . conforms readily to any product . . . grips it gently but securely. *Speed?* Light weight and high kink-resistance make the sling easy to carry, attach and remove. *Economy?* A compact braided sling conserves manpower and materials, compared with bulky types. Even when lifting heavy locomotives, turbines, pressure towers or weapons, a Yellow Strand Braided Sling will require fewer men —and less steel. And for such lighter lifts as jigs, tools, drums or crates, a Yellow Strand Sling offers relief from the fiber shortage. Fitting material-handling equipment to your specific job is the function of Broderick & Bascom's specialized Sling Engineers. Investigate today!

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Branches: New York, Chicago, Houston, Portland, Seattle
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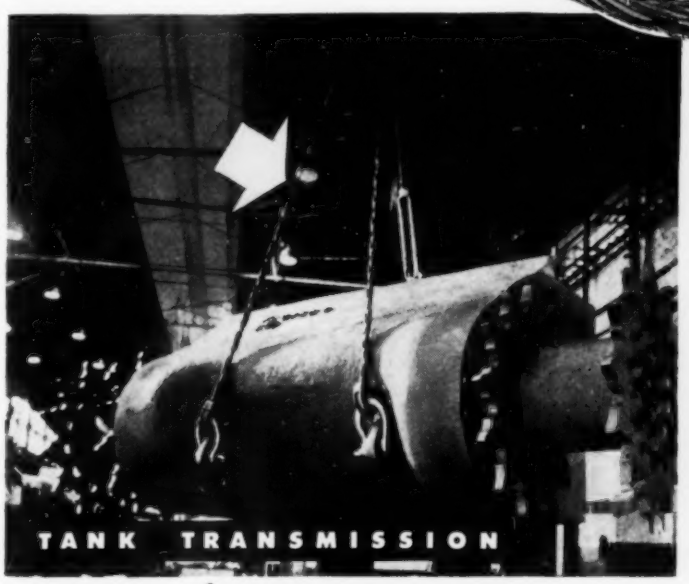
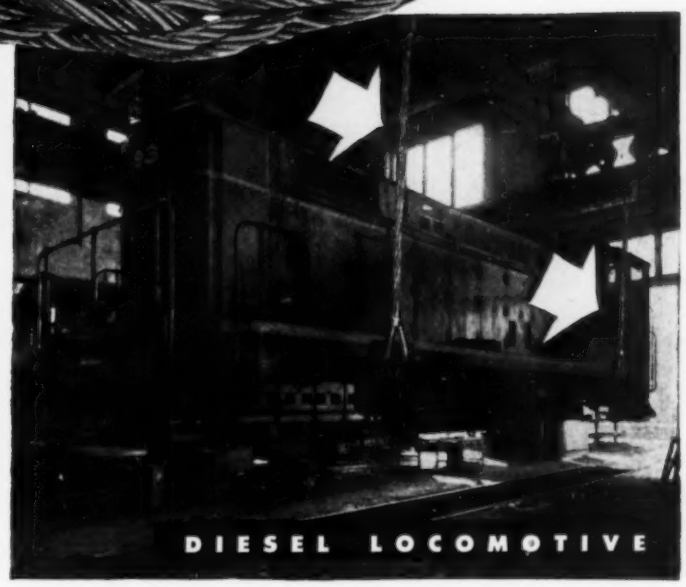
Riggers' Hand Book
96-pages of practical wire rope sling information. Send for free copy.





*Patents: U. S., 1475859, 1524671, 2142641, 2142642, 2299568 • Canadian, 252874, 258068

BRODERICK & BASCOM

YELLOW STRAND
Braided Wire Rope SAFETY SLINGS

JACKSON
FLEXIBLE SHAFT VIBRATORS

. . . are the choice of those who want JACKSON standards of quality, dependability and performance. No other flexible shaft vibrator can offer such assurance.

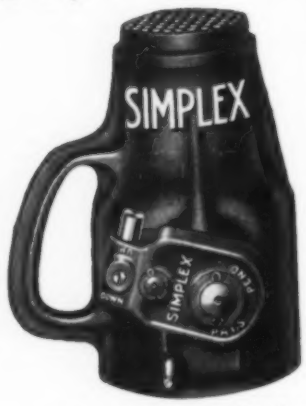
Supplied with a 2⅝" and a 1¾" head. These two heads give user a vibrator efficient in and suitable for a wide range of applications. For instance, from wall sections of comparatively large size to narrow sections.

Model FS-6A, illustrated above, is furnished complete with 7, 14, 21 or 28 feet of shaft. Has dirt-proof turntable base. Supplied with or without wheelbarrow mounting.

Write, wire or telephone for further information

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON, MICHIGAN

Average Man Lifts 690 Times His Weight with this "Manpower Stretcher!"



15, 25, 35 and 50-tons capacity, 10" high, 5" lift (50-tons has 4" lift).

Low in height—high in capacity and efficiency. Invaluable for heavy work in cramped quarters. Tops for the safe lifting of buildings, bridges and heavy machinery. Wide bearing area, broad corrugated cap and base. Ratchet and lifting mechanisms are fully enclosed and dirt-proof. Ask for Catalog 44.

Simplex
LEVER · SCREW · HYDRAULIC
Jacks

Templeton, Kenly & Co., Chicago (44), Ill.
Better, Safer Jacks Since 1899

(Continued from page 154)

candles or more may well be satisfactory from the brightness standpoint.

Indirect lighting with F lamps is satisfactory at illuminations above 50 foot-candles even in large rooms for a number of reasons. Direct lighting with F lamps is also satisfactory above 50 foot-candles; however, between 30 and 50 foot-candles, it becomes less desirable. Where F lamps are used in the drafting room to provide less than 30 foot-candles, the indirect or semi-indirect types of lighting are definitely recommended.

★ ★ ★

TVA

Prefabricated Houses

(Continued from page 69)

manufacturing efficiency, and that architectural objectives could be gained by arranging standard pieces in different patterns.

Design proceeded on the basis of this agreement, with structural analysis frequently determining the final decision with respect to the design of structural units. Each piece of material and structural unit was studied in terms of weight, size, structural contribution and feasiblity for production. The intensive work produced balanced designs which attracted the attention of a government agency concerned with providing a large volume of housing for two war projects. TVA made its plans available, solicited manufacturers and interpreted the drawings for their guidance in bidding on housing contracts. Contracts for several thousand sectional houses were awarded to six manufacturers. The manufacturers quickly set up their production machinery, and sectional houses soon were being shipped from the factories.

As designed by TVA, the two-section single-bedroom house is 15½x24 ft. in plan, the three-section two-bedroom is about 24x27 ft., and the four-section three-bedroom is roughly 32x24 ft. An accompanying floor plan shows the layout of the two-bedroom house.

Factory Fabrication—As already indicated, TVA houses go several steps beyond the stage of ordinary prefabrication. Prefabricated panels varying in size up to

(Continued on page 158)

Help Accomplish the Mission!

Roaring defiance, bombers and escort fighters break the Pacific silence as they take off for the next objective. Below are the men with their machines who carved out the base that made this mission possible . . . who even now plan to follow up the bombers with another invasion thrust.

It takes hands and hearts of steel to beat back a swamp-laden jungle, infested with every type of reptile and disease carrying agent . . . to withstand unbearable heat and gnawing homesickness. As one Seabee said, "People back home cannot by any stretch of the imagination realize the tremendous amount of hard work that must be done before the smallest effort can be exerted against the enemy."

Courage and determination to see the job finished . . . modern, fast-moving tractors operating bulldozers, giant-sized scrapers and other grading equipment are the fighting tools of our construction battalions. A winning combination . . . and one that deserves the backing of every last one of us!

While they give all, we can give a little! Let's keep on buying War Bonds, Donate Our Blood, Conserve Food, Salvage Scrap and do the other small things asked of us. Let's help accomplish the mission!

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

BACK THE ATTACK . . .
BUY MORE WAR BONDS THAN BEFORE!

do the shovels you're using . . .
WEAR-BACK HERE ?
BREAK HERE ?
TUBULAR SHANK
THIS SHOVEL HAS A BACKBONE
17 GAUGE
13 GAUGE
17 GAUGE
(SOCKET)
(FROG)
All Formed of Thicker Steel
(CUTTING EDGE)
RAZOR-BACK Shovels
are 60% thicker at these points of wear and strain — taper to the sides. Give you 13 gauge strength and stiffness, only 15 gauge average weight.
THE UNION FORK & HOE CO.
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ALSO STONE, BALLAST, INDUSTRIAL FORKS, ASPHALT AND ROAD RAKES — DISTRIBUTORS EVERYWHERE

How to design and erect
reinforced concrete and masonry structures

Here's an up-to-the-minute tool for construction engineers, contractors, estimators, draftsmen, superintendents and others—a great volume of facts and figures to help you with every aspect of designing and constructing durable, economical, serviceable, and good-looking structures of reinforced concrete and masonry.

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Over 800 pages packed with necessary theory and design factors—design methods and examples—construction essentials—specifications—and other invaluable information are given in this book, compiled by experts and presented in the straight-to-the-point, engineering fashion of the famous Hool and Kinne books. Save time and effort—and improve results—by consulting this book when problems arise in your work—by using it again and again for the fact, formula, or exact detail you need, when you need it.

See the first four sections for a complete treatment of concrete problems, from designing the best mix for a given job and locality, etc., to both regular and special methods of finishing concrete surfaces. Other sections cover the design of bridges, chimneys, retaining walls, dams, sewers, reinforced concrete buildings, etc.

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835 pages, 6 x 9, 499 illustrations, $6.00

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(Continued from page 156)

8 ft. wide by 28 ft. long are made up in the first stage for floor, walls and roof. Floor and roof panels are constructed in accordance with the stressed-skin principle, the plywood sheets being glued and nailed to the frame, to develop maximum structural strength. In the second stage of manufacture, the finished panels are assembled into house sections on an assembly line. Following this operation, the procedure calls for installation of plumbing, electrical work, fixtures, equipment and furniture. At the proper stage of the process, the sections are painted.

By the factory method of fabricating and equipping house sections, 90 percent of the work of building a house is completed in the plant, as compared with 65 percent for ordinary prefabricated panel construction. Only 10 percent of the work remains to be done at the site, instead of the 35 percent required in assembling and completing a house of prefabricated panels. Efficiency is gained by doing a large portion of the work under roof, where neither weather nor other uncontrolled conditions affect production operations.

Economy of Housing

Shipping costs determine the relative economy of factory-fabricated sectional houses as compared with other types of prefabricated construction. TVA houses are designed for highway shipment on flatbed trucks and trailers. A sectional house ships a large volume of air. In fact, a house of four sections could be shipped in two loads (about half the space) if it were in panels. Despite the greater bulk, analyses based on figures from large operations show that TVA houses can compete in overall costs with panel houses up to a distance of at least 200 mi. For moving houses from one site to another, the sectional units hold a decided advantage on short hauls and can compete up to a distance of 1,000 mi. or more. This last fact, plus the added advantage of doing 90 percent of the work outside critical labor areas, led to the important use of TVA prefabricated sectional houses in the war effort.

Future Possibilities

Development of the mobile, sectional house has occurred in a period of only four years. Manufacturers already have devised a variety of methods for handling fabrication of the sections. Additional experience in the future will help to determine what methods are most efficient.

House sections have been shipped as single loads on trailers hauled by light trucks and as double loads on truck-trailer combinations and on large flatbeds, all with about the same results. The choice

(Continued on page 160)

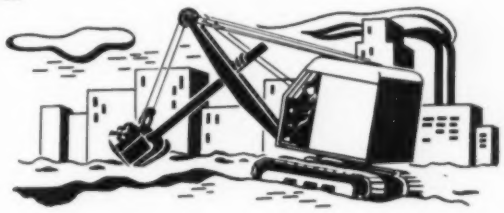
Raising a BLISTER—

Osgood Dependability Helps Speed Construction on Military Hangars

"Somewhere in England" this blister-type hangar is affording weather protection for the men and materials of our engineer troops. And in the foreground is a construction "warhorse" familiar to Army engineers the world over . . . a dependable Osgood shovel.

Whatever and wherever the job — slogging through Italian mud . . . chipping a runway in the flint-like coral of Pacific atolls . . . hacking a road out of Burma and African jungles . . . battling the frozen ground along the Alaskan Highway . . . plugging away at the common-place jobs here at home . . . or on Normandy fronts — rugged, powerful Osgoods are giving memorable wartime performance.

This global service, besides helping to win the war, is an exhaustive proving ground for better peacetime excavating equipment for you.



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OSGOOD
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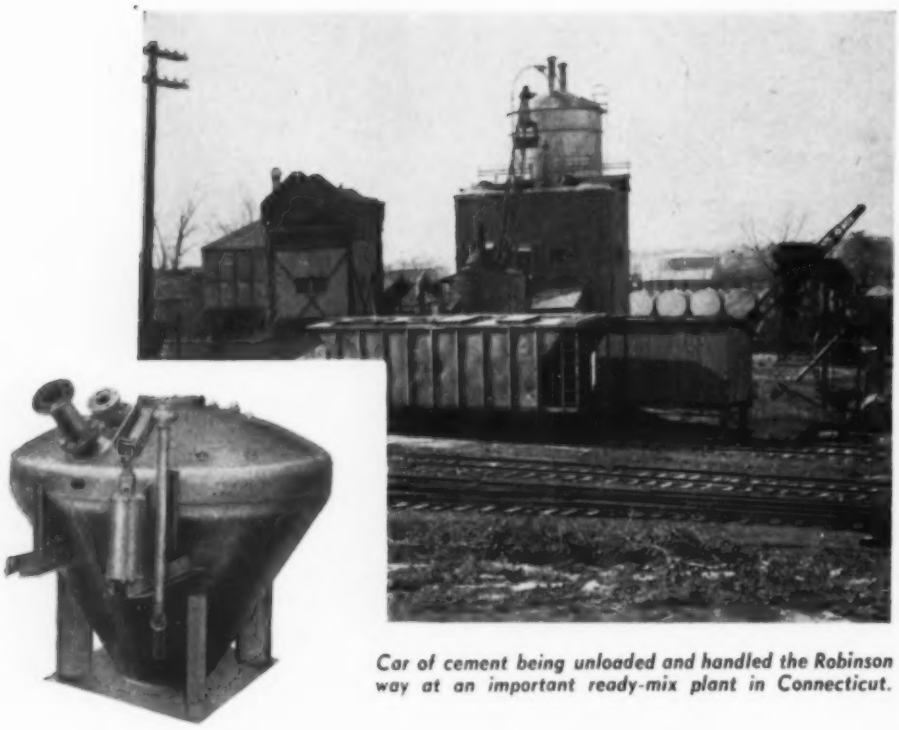
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

(Continued from page 158)

of equipment for the future will be decided by unloading technique, freight rates and highway regulations.

Sections have been unloaded onto the foundations by spotting the loads adjacent to the foundations and sliding or rolling the sections into position. For quick unloading and setting of house sections on the foundations, recent large war projects have used cranes, which can swing house sections from carrying vehicles anywhere within the immediate vicinity of the foundations. In the post-war future, a more elementary method of unloading is likely to be favored, especially for placing individual houses on scattered sites.

Several manufacturers who have worked with TVA are laying plans for the future of the sectional house. Others are investigating the possibilities of producing such houses. A question arises with respect to the manufacturer who wishes to operate on a national basis. How will the 200-mi. distribution radius affect operations? Because sectional houses are fabricated first in panels and later in sections, it would be possible to ship the panels to assembly plants and distribute the assembled sections from those points.



Car of cement being unloaded and handled the Robinson way at an important ready-mix plant in Connecticut.

How to Cut Costs of Handling Bulk Cement

. . . air-float it the Robinson way from Siding to Storage to Plant

The Robinson Air-Activated Conveyor is capable of transporting bulk cement through piping for thousands of feet. It can lift this cement several hundred feet. In short, the Robinson System is capable of handling your cement on practically any job from siding to storage to mixing plant.

The method is fool proof. The equipment is simple. There are no continuously moving parts such as motors, screws, shafts, etc. There is a marked economy in the use of air because the material is "floated" rather than blasted through the piping under high pressure or velocity.

The first Robinson "contractor" installation for handling cement was in 1935. Since then numerous contractors and cement companies have adopted the Robinson method for handling bulk cement.

Why not discuss its use for that next contract you're working on? We'll be glad to have a representative call.

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ROBINSON *Air-Activated* Conveyor Systems

***Division of* MORSE BOULGER DESTRUCTOR CO.**

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Representatives in All Principal Cities

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has superior advantages:

Low water ratio assures density at all points—no voids, no bubbles or air pockets. . . . Waterproof—perfect steel protection. . . . Greater strength with less thickness . . . No waste of material. . . . Great savings in time.

Recommended for rebuilding or relining disintegrated concrete and steel as well as new work.

National Gunite is a coast-to-coast engineering organization with years of experience, supplemented by field crews of skilled Gunite operators.

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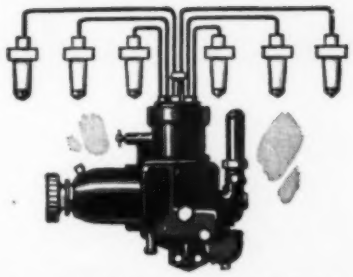
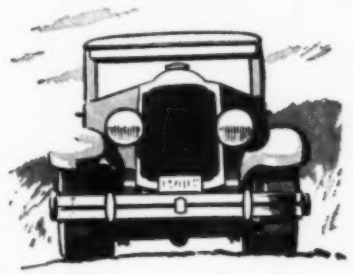


Dependable diesels are not built in a day. For instance, in perfecting the *exclusive* Cummins Fuel System, now an accepted model of simplicity and efficiency, 3,000 different injection mechanisms were developed and tested between 1923 and 1927 before Cummins engineers were satisfied. Insistence on "making it right," regardless of cost, explains why Cummins Diesels are known everywhere as *the dependable diesel.*



A Cummins-powered Packard sedan was the world's first diesel-propelled automotive vehicle. Driven in 1930 from Columbus, Ind., to New York City by designer-president C. L. Cummins at a fuel cost of only $1.38, the car was barred from the New York Auto Show and, later, the Atlantic City Road Show. Today, Cummins Diesels are found in practically all leading makes of heavy-duty trucks and construction equipment.

In 1930, under AAA sanction, the world's first official record for diesel-powered vehicles was established at Daytona Beach, Florida, by a Cummins Diesel installed in a Packard roadster—83 mph. The engine was a "dolled up" Model U designed for marine service. Although built to operate at 800 rpm., it was revved up as high as 1900 rpm. during the run, without any difficulties developing.

CUMMINS DEPENDABLE DIESELS

Automotive Models: Designed for all types of heavy-duty trucks in either highway or off-the-highway service.

★ ★ ★

Industrial Models: Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

★ ★ ★

Marine Models: Propulsion engines and marine type generating sets designed for all types of fishing boats, work boats, and pleasure craft.

Makers and Breakers of Precedents in Power

In the early 20's, most authorities conceded 600 rpm. to be "tops" for a diesel. Cummins conceded nothing—bumped the Cummins Diesel of that early day up to 900 rpm. and kept right on bumping. That's how the modern, high speed diesel was created . . . by making *and breaking* one precedent after another . . . by doing things in design, construction and metallurgy "that couldn't be done." As a result, today's high speed Cummins Dependable Diesels are doing tough, heavy-duty jobs scarcely dreamed of twenty, or even ten, years ago. Not only doing them, but doing them cheaper, better and faster than they were ever done before. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.

RAPID DUMPING FOR HI-SPEED

In digging and material handling, too, rapid discharge of the load is an essential feature. Every Owen Bucket is designed to incorporate rapid discharge operation — a factor responsible for their outstanding performance.

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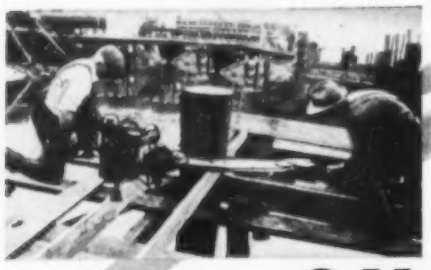
6020 BREAKWATER AVENUE CLEVELAND, O.

BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.

OWEN BUCKETS

A MOUTHFUL AT EVERY BITE



Mall

REG. U.S. PAT. OFF.

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For Chicago Contractor

5 H. P. MALL Gasoline Engine Chain Saw— 36" Capacity. Also Available in 24" and 48" Sizes.

A 15-HOUR JOB FOR 2 CARPENTERS WITH A CROSS-CUT SAW

Unskilled laborers can now cut and top piles and square heavy timbers to size with MALL Chain Saws after a few minutes instruction — at a surprisingly low cost. The 2-stroke cycle design gasoline engine starts easily . . . has stall-proof clutch and handle throttle, and uses little fuel. The 360 degree index permits sawing at any angle. Safety guard assures full protection. Pneumatic models also available. Electric, Gasoline Engine and Pneumatic sharpeners are available for sharpening chains in shop or field. *Write for literature and prices.*

MALL TOOL COMPANY, 7757 South Chicago Ave., Chicago 19, Ill.

ARMY E NAVY

Mall REG. U.S. PAT. OFF. PORTABLE POWER TOOLS

Brooklyn Bridge

(Continued from page 77)

tion platform lengthened about 200 ft.

An excellent safety record was established by Atlas as the result of careful planning, skillful workmen, and the vigilance of their foremen. With crews working within inches of the third rail, center stringers weighing 6 tons and 50 ft. in length were lifted up through the live trolley wires by crawler crane. The only casualty was a singed eyebrow. Normal traffic was maintained throughout all operations. Bulk of the Atlas contract was completed in March, 1944.

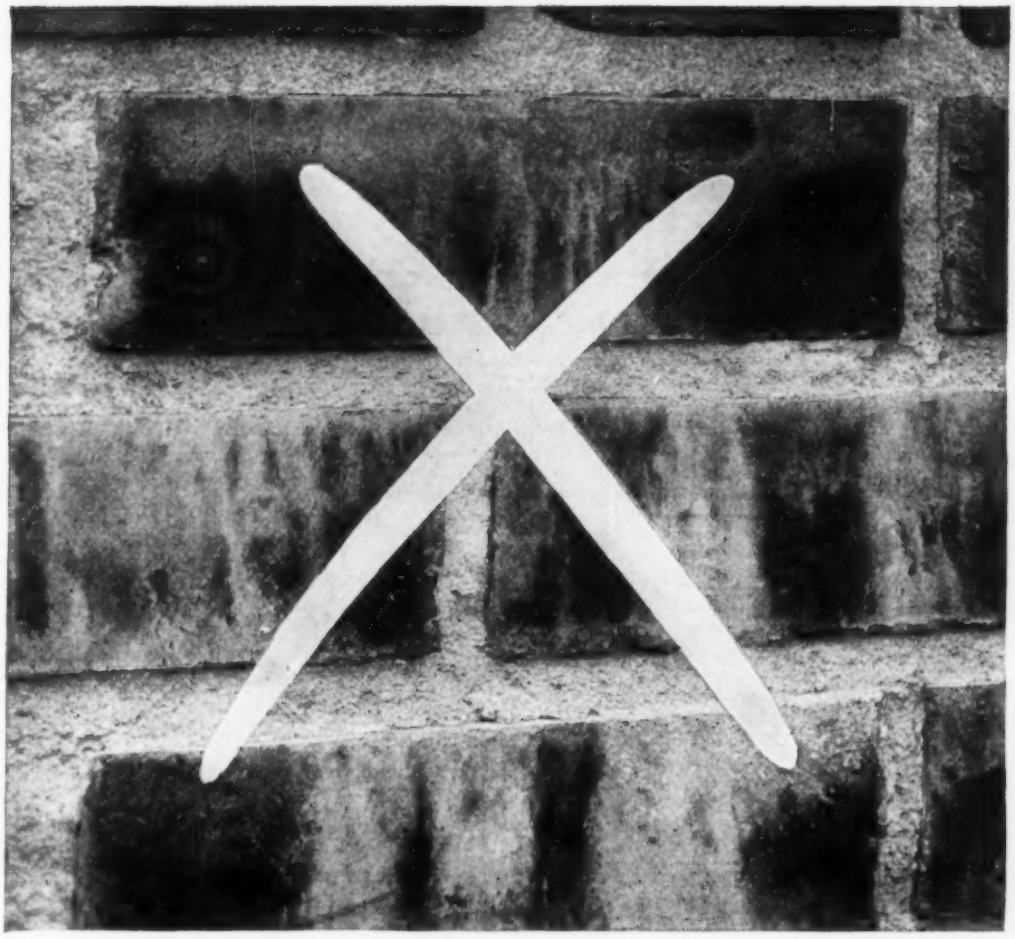
Geared to a fast demolition and construction schedule, E. W. Foley, Inc. moved their 200-man force into action in December, 1943. Under an extremely flexible contract demanded by the nature of the work, operations are divided as follows: (1) steel stripping; (2) wood stripping and construction; (3) electrical demolition and construction; (4) lighting; (5) track work; (6) waterproofing; (7) paving; (8) remodeling.

Outstanding activity at present is the

BREAKER GANG begins removal of trolley tracks with pneumatic drills at start of work Nov. 22, 1943, at Jay and Nassau Sts., Brooklyn.

demolition work. Three stripping crews, using three cranes and ten burners, raze more than 300 tons of steel per day. Ahead of the stripping a 35-man gang with air compressors, paving breakers and oxyacetylene torches removes spikes, handrails, lumber, masonry and miscel-

(Continued on page 164)



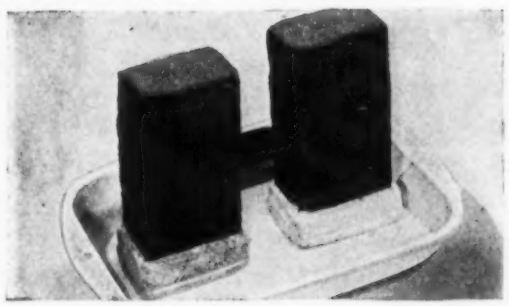
BRIXMENT *Mortar Helps Prevent Efflorescence*

● EFFLORESCENCE is an outcropping of minute white crystals on brickwork. When these crystals occur on colored mortar joints, the condition is sometimes mistaken for *fading.*

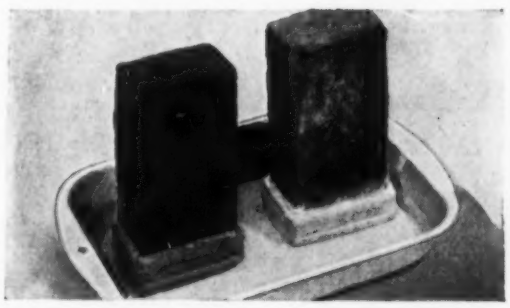
Efflorescence is caused by the presence of soluble salts in masonry materials. When reached by water, these salts dissolve, and are drawn by evaporation to the surface of the wall.

Brixment itself *does not cause efflorescence* because it is practically free from soluble salts. Even when such salts are present in the sand or brick, the waterproofing in Brixment mortar usually *prevents them from coming to the surface.*

Bricklayers who have used Brixment mortar for years say they have far less efflorescence with Brixment than with any other mortar.



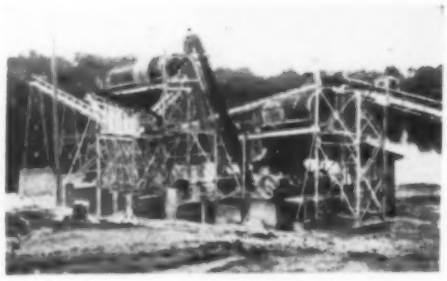
"Cap" one brick with Brixment mortar, and one brick with mortar made with 50-50 cement and lime. After mortars have hardened, place both brick in a pan of shallow water.



Keep about an inch of water in the pan. Even if soluble salts are present in the brick or sand, you will soon be convinced that Brixment mortar helps prevent efflorescence.

LOUISVILLE CEMENT COMPANY, Incorporated
General Offices: Louisville 2, Kentucky
Cement Manufacturers Since 1830

Reliance *is Ready for the End of the War*



RELIANCE PRODUCTS

Rock Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveyors, Grizzlies, Air Separators, Sand & Gravel Spreaders, Wash Boxes.

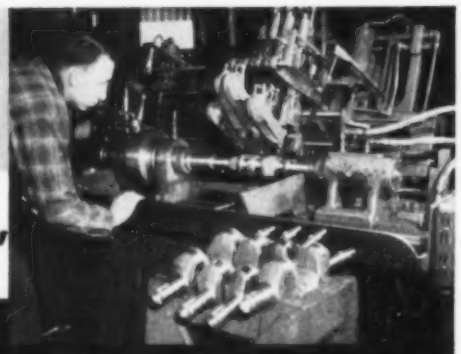
RELIANCE Washing-Screen Plants, Crushers, and Conveyors are being installed on the global war fronts and at training stations elsewhere. The photo shows one set up on a river bank—"somewhere in South America".

The rugged construction of RELIANCE equipment amply fits it for RUSH War work. The same equipment will soon be available, we hope, for construction at home.

Advise us what your plans for Post-War work will require. Tell us the type, size and amount of washing, screening, crushing and conveying equipment, which you are likely to need. Then we can prepare intelligently to help you meet Post-War demands, which may come suddenly. *Write to-day.*

UNIVERSAL ROAD MACHINERY CO.
Kingston, N. Y., U. S. A.
DISTRIBUTORS IN ALL PRINCIPAL CITIES OF U.S.A.

SUPERFINISHED CRANKSHAFTS
another
"PLUS FEATURE"
IN ALL
WISCONSIN *Air-Cooled* ENGINES



The very ingenious, specially designed machine illustrated above, puts a mirror-smooth *superfinish* on the crank-pins of all Wisconsin Air-Cooled Engines. By combining perfectly synchronized rotating and oscillating polishing movements, absolutely uniform diameter is maintained over the full length of the crankshaft bearing surfaces.

This is just another of the many small, but *important production details* that account for Wisconsin heavy-duty serviceability and smooth, efficient operation. Just another reason, too, why *your equipment* should be powered by a Wisconsin engine.

Most H.P. per pound
WISCONSIN MOTOR Corporation
MILWAUKEE 14, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

(Continued from page 162)

laneous scrap. They also dig out pavement around the column bases, strip the concrete on the superstructure and burn the nuts from the anchor bolts. To date, more than 4,000 tons of steel, wrought iron, cast iron and steel rail have already found their way to the scrap yards and the remodeling section, and 4,000 additional tons will soon be stripped.

Heavy crawler-mounted and truck-mounted P&H wrecking cranes, each carrying a 50-ft. boom with sling, travel back and forth alongside the structures or are moved onto the bridge as the occasion demands, to load dismembered steel on to waiting trucks. As a rule, five burners work with each wrecking crane. Three burners operate ahead of the crane, cutting joints to a point where the men with the crane can do the final burning operation after the rig has taken a strain on the slings lifting the superstructure member.

In tight locations, particularly on the bridge where trolley traffic might prohibit the use of crawler cranes, simple house derricks or "dutchmen" relieve the strain on the slings supporting the member to be severed, and then lower the cut girders, that measure up to 50 ft. in length and weigh as much as 6 tons, to the bridge deck where they are placed on rollers and pushed within reach of a 15-ton P&H crane.

STEEL PLATING on steps leading to old elevated traffic station is removed by common crowbar and scrapped.

For the demolition of the terminal structure at Sands St. a Koehring crawler crane carrying a 20-ft. jib on an 80-ft. boom moves in alongside at street level and removes the cut steel from the roof down. At Jay and Myrtle Aves. two 25-ton capacity cranes weighing 55 tons each, equipped with 50-ft. booms, are

(Continued on page 166)

BE SAFE-
NOT SORRY
ABOUT THOSE GEARS!

ALWAYS USE MOBILUBE GEAR OILS! These highly stable, straight mineral oils, developed especially for heavy-duty service, are much more efficient than older-type gear oils. Free of abrasives, soaps, fillers, all foreign materials. Keep scuffing and wear at a minimum . . . withstand long service. Mean fewer gear breakdowns — LESS TIME LOST FROM THE JOB! Get this protection now!

OTHER SOCONY-VACUUM TIME SAVERS:

DELVAC OILS — For all automotive-type Diesel and heavy-duty gasoline engines. Minimize sludge deposits. Resist to an extreme degree formation of oil oxidation products. Will not corrode hard alloy bearings. Help engines operate at maximum efficiency with minimum maintenance.

MOBILUBE "V" — A special, short-fiber, soda soap grease developed primarily for wheel bearings and grease-type universal joints but also recommended for other automotive parts operating at high temperatures such as clutch release bearings. Long-lasting and remarkably efficient. Recommended for year around use.

Talk with your Socony-Vacuum Representative

Mobilgas
SOCONY-VACUUM

USE SOCONY-VACUUM FUELS, LUBRICANTS, AND ENGINEERING SERVICE!

KEEP ENGINES "ON SCHEDULE" WITH SOCONY-VACUUM'S FAMOUS

MOBILUBE *Gear Oil*

SOCONY-VACUUM OIL CO., INC., and Affiliates: Magnolia Petroleum Co., General Petroleum Corp. of Calif.

(Continued from page 164)

being used in conjunction to strip and demolish center girders 97 ft. in length, 8 ft. high, and weighing 30 tons each.

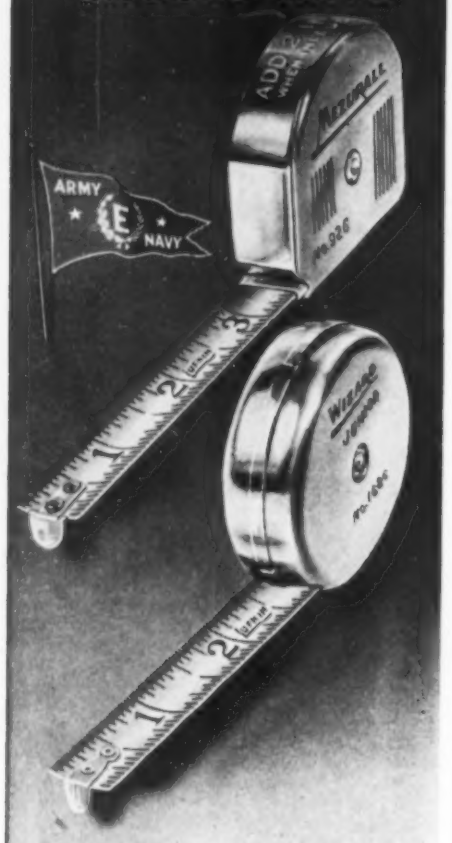
For speed and heavy cutting of badly scaled steel, No. 4 acetylene Metro torch tips are used by the burners. Various torch handle lengths ranging from 2 to 4 ft. reach out-of-the-way places and are long enough to keep the burners out of the excessive fumes. Heavy cutting consumes about 200 cu. ft. of acetylene and about 900 cu. ft. of oxygen per man per day. Faced with the deadly lead paint gas fumes from the burning steel, the operators wear a cannister-type respirator, strapped on their backs and connected by a flexible rubber tube to a mask which covers the nose and lower part of the face. The cannister contains a filter of activated charcoal and gravel. Some of the men also wear asbestos sleeves for added protection.

Most dismantled steel is placed on trucks and hauled away to be transshipped to steel mills. Only 3.5 per cent of this material will be necessary in the new construction. Not more than 20 tons of new steel is expected to be used. This method of re-use is a much more

(Continued on page 170)

LUFKIN

TAPE RULES THAT EVERY ENGINEER SHOULD HAVE



Every busy engineer needs a Lufkin Mezurall or Wizard Jr. steel tape rule for his vest pocket—where it's handy and ready for those dozens of little measuring jobs that come up every day.

Ideal for general measuring work—inside, outside, height or depth. They're accurate for both hook or butt end measurements. Six feet long, they remain rigid when extended yet will wrap around corners or curves with ease. Write for free catalog.

BUY THROUGH YOUR DISTRIBUTOR

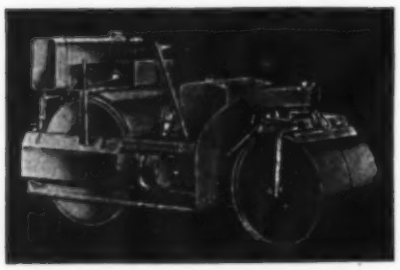
LUFKIN

SAGINAW, MICHIGAN • New York City

TAPES • RULES • PRECISION TOOLS

C.H.&E.

3 Ton Roller



For rolling footpaths, driveways, sidewalks, tennis courts, playgrounds, and general maintenance work. The forward and reverse speed is controlled by one hand lever. Both front and rear rolls can be filled with water. Easy to load on a truck for transportation from job to job.

We also manufacture Saw Rigs — Pumps — Hoists — Bar Cutters and benders.

Write for catalog.

C. H. & E. Manufacturing Co.
3847 No. Palmer St.
Milwaukee 12, Wis.

Here Is Your Nearest Worthington Distributor

For Sales, Rentals and Service on BLUE BRUTE Portable Compressors, Rock Drills and Air Tools.

See full page ad 4th Cover

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Birmingham—Tractor & Equipment Co.
ARIZONA
Phoenix — Smith Booth Usher Company
ARKANSAS—Fort Smith — R. A. Young & Son
Little Rock — R. A. Young & Son
CALIFORNIA
Los Angeles — Smith Booth Usher Company
San Francisco—Edward F. Hale Company
CONNECTICUT
Hartford — The Holmes-Talcott Company
GEORGIA
Atlanta — Tractor & Machinery Co., Inc.
ILLINOIS — Chicago— Kennedy-Cochran Co.
INDIANA
Indianapolis — Reid-Holcomb Company
IOWA— Des Moines — Electrical Eng. & Constr. Co.
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MONTANA— Helena — Caird Engineering Works
NEW JERSEY
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NEW MEXICO
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SOUTH DAKOTA
Sioux Falls — Empire Equipment Co.
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El Paso—Equipment Supply Company
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Richmond — Highway Machinery & Supply Co.
WASHINGTON
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WEST VIRGINIA
Fairmont — Interstate Engineers & Constructors
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Eau Claire — Miller, Bradford & Risberg Company
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Get more WORTH from air with WORTHINGTON

Buy Blue Brutes

Worthington Pump and Machinery Corp.

Loading Gravel from Stock Pile

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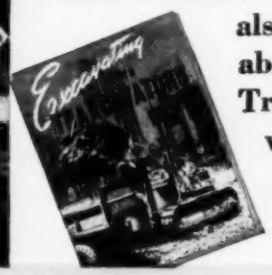
Road Widening

MASTER OF ALL JOBS

TRAXCAVATORS are the world's most versatile earth and material moving machines. In addition to digging and loading, they ditch, cast, carry, spread, backfill, level, and do a host of other tasks. Highly mobile, TRAXCAVATORS travel around jobs under their own power at speeds up to six miles per hour . . . can readily be transported on streets and highways. Powered by "Caterpillar" track-type tractors, with bucket capacities from ½ to 2½ cubic yards. Bulldozer blade, quickly interchangeable with the bucket, and other attachments also available. Get the facts now, about TRAXCAVATORS from your Trackson-"Caterpillar" dealer or write for informative booklet to TRACKSON COMPANY, Milwaukee 1, Wisconsin.



TRAXCAVATOR

The Original Tractor Excavator

WHERE TO BUY

NEW EQUIPMENT—ACCESSORIES—MATERIALS—SUPPLIES

'RAMSEY'
3-Speed . . . ALL-STEEL
HAND WINCH

2 Sizes

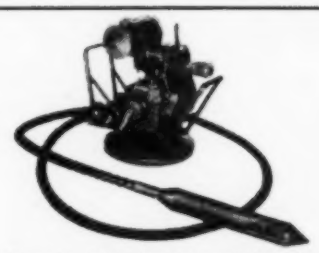
5-ton capacity — 135-lb. spools, 325' of ½" cable $85
3-ton cap'y — 75-lb. spools, 150' of ½" cable $60

POWER FOR HEAVY LOADS, SPEED FOR LIGHT LOADS. Gear Ratios: 25 : 1, 4 : 1, 1: 1.

Write for circular and name of nearest dealer. A few territories are open for live distributors.

Manufactured by
RAMSEY MACHINERY CO.
1626 N. W. THURMAN ST., PORTLAND, ORE.

COMPLETE
WELL POINT SYSTEMS
WILL DRY UP ANY EXCAVATION
Faster—More Economically
Write For Job Estimate and 32 page Catalog
COMPLETE
MACHINERY & EQUIPMENT CO., Inc.
36-36 11th St., Long Island City, N. Y.
Tel. IRonsides 6-8600
Branch: Third Avenue & Adams St., Gary, Indiana
Telephone: Gary 23983



Concrete VIBRATORS and Grinders
Write for Circular on types, sizes and prices
White Mfg. Co.
ELKHART INDIANA

If this or other advertising does not supply the information concerning products or services wanted, please write:
CONSTRUCTION METHODS

STERLING PUMPS
STERLING QUALITY
SIMPLE
DEPENDABLE
RUGGED
•
WRITE NOW

CHOICE OF LEADING CONTRACTORS EVERYWHERE
STERLING MACHINERY CORPORATION
405 Southwest Blvd., Kansas City, Mo.

Your Inquiries to Advertisers Will Have Special Value . . .

—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publisher to secure more advertisers and—more advertisers mean more information on more products or better service—more value—to YOU.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT : BUSINESS : **"OPPORTUNITIES"** : EQUIPMENT : USED OR RESALE

Rate: UNDISPLAYED
10c per word per insertion. $2.00 minimum. Address c/o Publication is 10 words. Positions Wanted ads half rate.

Rate: DISPLAYED
$8.00 per inch per insertion. Contract rates on request. Individual spaces with border rules, 30 inches to a page.

NEW ADVERTISEMENTS received by September 28th will appear in the October issue, subject to space limitations.

FOR SALE

3-LOW HEAD PUMPS

FOR { CIRCULATING WATER / IRRIGATION / UNWATERING AND DRAINAGE

ALLIS CHALMERS—Vertical Centrifugal
Direct Connected Motor Driven Units

2—Pumps are—Type L.S. Size 42" x 36"—48,000 G.P.M.
31 Ft. Hd. 319 R.P.M.—500 H.P.—2200 Volts—3 Phase—60 Cycle

1—Pump is—Type L.S. Size 42" x 36", 35000 G.P.M.
31 Ft. Hd. 350 R.P.M. 2 Speed 2200 Volts—3 Phase—60 Cycle

IMMEDIATELY AVAILABLE DIRECT TO YOU

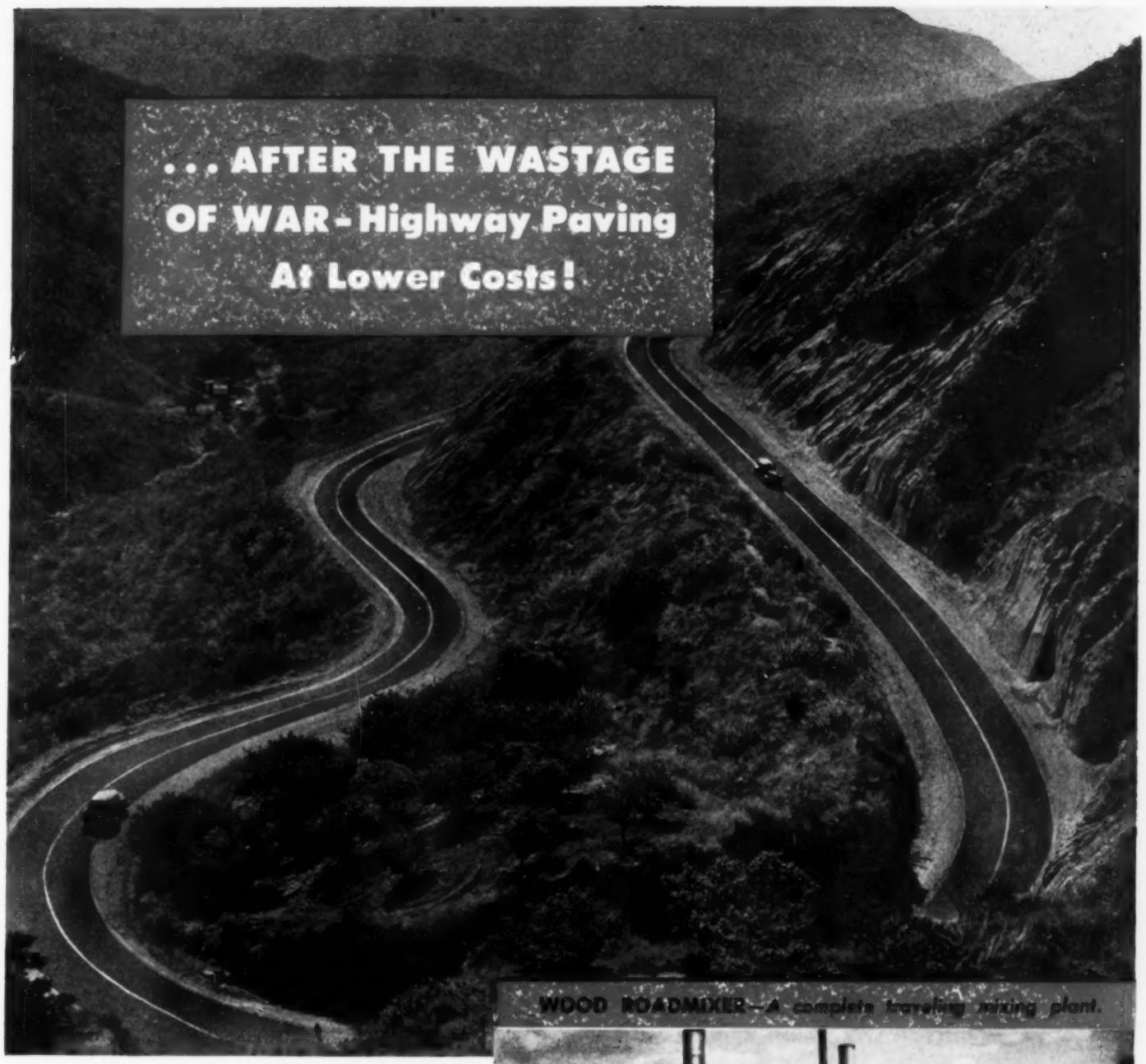
UNION ELECTRIC CO. OF MISSOURI
312 N. 12TH BLVD. ST. LOUIS, MISSOURI

1. No. 2 Koehring 3-way combination crane, dragline & Shovel
7. Allis Chalmers Speed-Ace Tractor Wagons, 7½ yd. cap.
5. Super "C" Model 15 FDT Euclids, with Cummins Diesel Engines
10. Model 9FDT Euclids with Cummins Diesel Engines
2. 500 CFM Ingersoll-Rand Diesel-powered portable air compressors
1. 315 CFM Ingersoll-Rand Diesel-powered portable air compressor

IRON & STEEL PRODUCTS, INC.
13458 S. BRAINARD AVE.
CHICAGO 33, ILLINOIS
"Anything containing IRON or STEEL"

FOR SALE!
1 — 3-yd MONIGHAN ELECTRIC Walking Dragline — with 76-ft. Boom, complete with Transformer and Lead Cable. Excellent Condition! Location, southern Illinois.
INDIAN HEAD COAL CO.
612 N. Michigan Ave., Chicago, Ill.

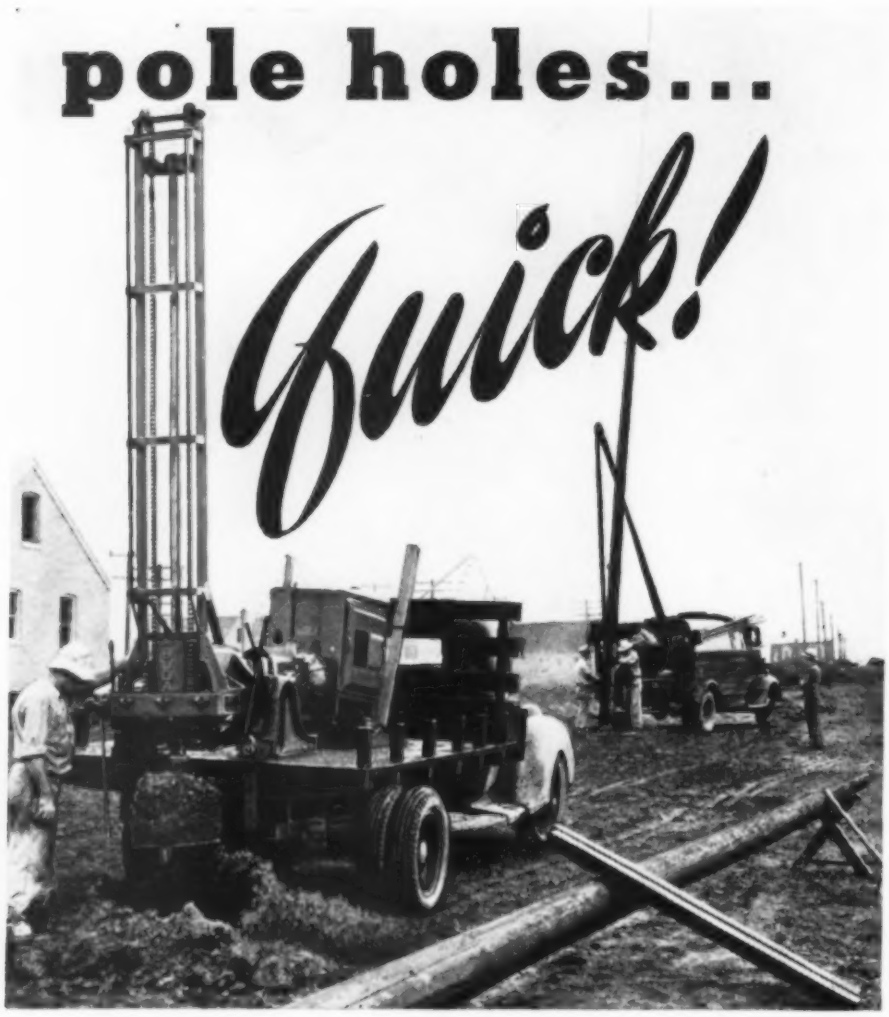
Somebody—Somewhere,
needs your idle equipment! Reach that buyer quickly and economically thru the
"SEARCHLIGHT SECTION"
The meeting place of Used Equipment Buyers and Sellers



WOOD ROADMIXER—A complete traveling mixing plant.

Wood Roadmixers, the world's pioneer and leading traveling plant method of pavement construction, are furnishing dollars-and-cents evidence that top quality highways can be built for as little as one-third the cost of usual methods. The Wood Roadmixer permits the use of native or local materials, proportioned and mixed *on the job.* The Wood Roadmixer allows complete flexibility in the design, preparation and finish of a job. Designers, engineers and contractors are discovering that Wood Roadmixers produce better paving faster and at less cost. More and more jobs are being designed for road-mix—and built by Wood Roadmixers.

Meet tomorrow's demands for *top quality, low cost* pavement construction. *Economy must become the national watchword!* Get the complete story of the Wood Roadmixer . . . Write for literature and costs.



Eliminate HAND digging!

Clean straight holes for poles, guard rail, fence post, piers, etc Shallow, medium or deep holes, quicker, easier, better with the modern BUDA Earth Drill.

Write or Wire for Bulletin

BUDA

15425 Commercial Ave. **Harvey (Chicago Suburb) Illinois**

(Continued from page 166)

expensive process than the outright purchase of new steel, but the demand by our armed forces on such vital material makes the practice mandatory.

Track work involving a total of 5 mi. at 18 different locations at a cost of $151,000 calls for special planning in order to coordinate trolley traffic with the demolition and reconstruction activity and avoid interference. This is entirely the contractors' responsibility and is being handled with remarkable simplicity.

Power demolition and installation provides perhaps the largest and most difficult item of work. On the bridge proper more than 13,000 ft. of third rail is being removed. Ten miles of wire is to be stripped and replaced with a like amount of new overhead wire, requiring 500 trolley line poles. The poles are of the sectional type measuring 9 in., 8 in. and 7 in. in dia., heavily constructed of sheet steel. They are mostly 28 ft. high and implanted 6 ft. in previously constructed concrete boxes. More than 8,000 ft. of specially designed trolley troughs of long leaf yellow pine carry the wires across the bridge, avoiding any metal contact.

General

Re-erection of steel, largely of remodeled material, will require more than 12,000 ft. of welding. Ten miles of cable are being stripped, remodeled and installed again. About a mile of fence will come down, will be restyled and then re-erected. Waterproofing on top of existing concrete amounting to 15,000 sq. yd. is in process. Construction plans call for an expenditure of $30,000 for paving involving 12,000 cu. yd. of concrete for the revamping of the approaches. The contractor expects easily to make his completion date set for November, 1944.

Administration

For the Board of Transportation, of which Jesse B. Snow is chief engineer, the project is directed by J. H. Griffin, division engineer, and Charles M. Madden, assistant division engineer; on the job in the field is W. H. Stuart, engineer, assisted by S. Friedman. Operations of the Department of Public Works are directed by Homer R. Seely, deputy commissioner; J. Frank Johnson is director of the Division of Construction and Operation and John H. Dooley is resident engineer in charge of field work.

Functions of contractor E. W. Foley, Inc. are under the supervision of general superintendent "Mike" Dorcic, who recently supervised construction of the 26th Ward Sewage Disposal Plant. Prior to that he was superintendent of construction at the Coney Island sewage disposal job and the New York World's Fair Independent Subway for the Foley company.

Don't let a "LAZY" oil strangle your tractors

keep equipment on the "GO" with hard-working TALPEX

There's no place for a "lazy" oil in the engine of a tractor that's working on a wartime schedule.

What is a "lazy" oil? It's an oil that simply doesn't have the stuff to do a good lubrication job. It piles up carbon fast, causes excess sludge in the crankcase, sticky valves, lacquer deposits on rings and pistons. It may be a well refined oil but that's not enough. To be efficient an oil must have *all* of the following properties of Shell Talpex.

NEW SHELL TALPEX

IS NON-CORROSIVE to alloy bearings. Protects all lubricated engine parts against corrosion.

HAS EXCEPTIONAL OXIDATION STABILITY. Holds to a minimum the formation of sludge, lacquer and other deterioration particles.

HAS HIGH DETERGENCY. Helps keep carbon, lacquer and foreign particles from adhering to pistons and rings, valves, ports.

HAS LOW CARBON-FORMING TENDENCY. Reduces ring sticking and wear. Lengthens engine life.

If the oil you now use doesn't have *all* these properties, it's lazy . . . should be changed to hard-working Shell Talpex. Ask the Shell man to show you why.

SHELL

TALPEX

THE NEW, ALL-PURPOSE, HEAVY-DUTY LUBRICANT

For trucks, busses, tractors, shovels, stationary and marine Diesels

You'll get more of tomorrow's highway contracts . . . . if your pumping costs are the lowest
CARVER Certified PUMPS
CARVER PUMP CO.
MUSCATINE IOWA

Low Cost Water— by CARVER

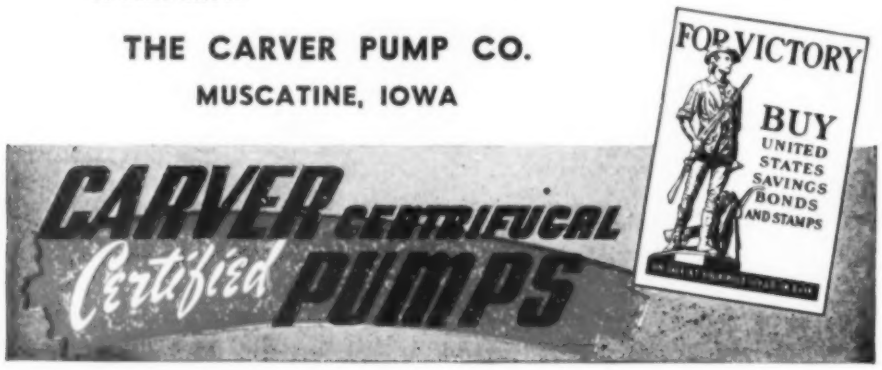
Carver Certified Pumps can save you many hours and dollars on your pumping jobs. Lifetime tungsten carbide seal, special long life impeller and removable liner, and trouble-proof design enable Carver pumps to handle water filled with mud, grit or sand and there will be less time out for maintenance. Low first cost, fast priming, efficient, non-clogging action, mean that Carver pumps get to work faster, stay on the job longer, and, most important of all, pump more water at less cost per gallon.

Every Carver pump carries a "Certified" tag—proof that it fully meets our high standards for performance on the job—your assurance of top performance on your toughest jobs.

For complete information, see your nearby Carver distributor or write direct.

THE CARVER PUMP CO.

MUSCATINE, IOWA



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American Cable Division
American Chain & Cable Co., Inc. ....3rd Cover
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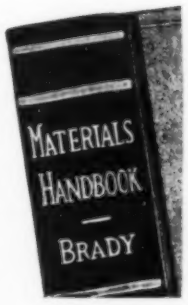

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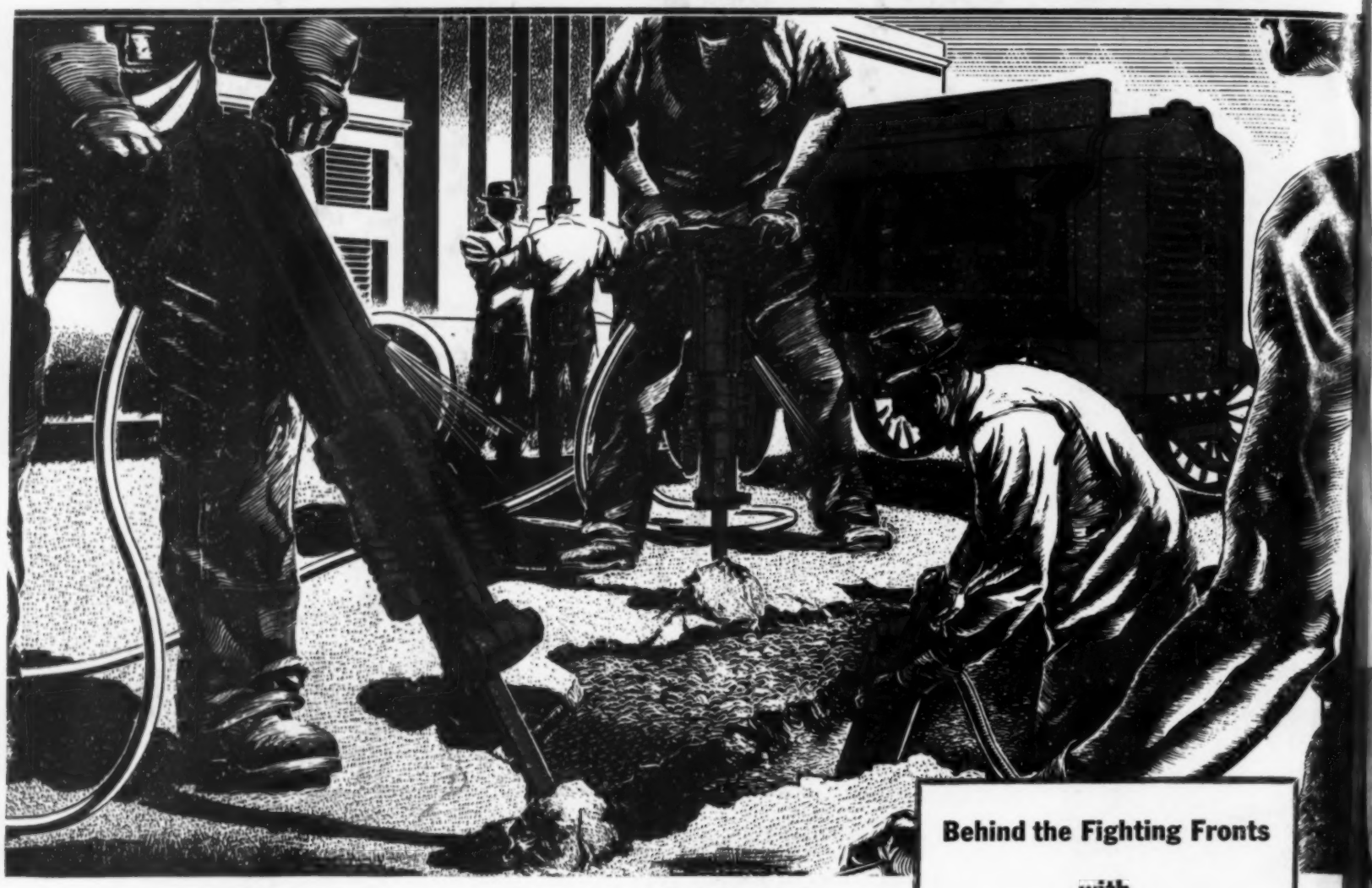

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